Wisconsin Groundwater Advisory Committee

2007 REPORT TO THE LEGISLATURE

December 2007

GROUNDWATER ADVISORY COMMITTEE MEMBERS

Ron Kuehn, Committee Co-Chair, Representing Agricultural Interests
M. Carol McCartney, Committee Co-Chair, Representing Industrial Interests
Todd Ambs, Department of Natural Resources
Mike Carter, Representing Agricultural Interests
Valerie Dantoin, Representing Agricultural Interests
Dan Duchniak, Representing Municipal Interests
Andrew Graham, Representing Environmental Interests
Stuart Gross, Representing Environmental Interests
Doug Hahn, Representing Industrial Interests
David Holdener, Representing Industrial Interests
Lawrie Kobza, Representing Municipal Interests
Keith Meyers, Representing Well Drillers
Robert Nauta, Representing Municipal Interests
Jodi Habush Sinykin, Representing Environmental Interests

SCIENCE AND TECHNICAL WORK GROUPS

Geology, Hydrogeology, Hydrology and Public Health
Ken Bradbury, Wisconsin Geological & Natural History Survey
John Jansen, Ruekert & Mielke Aquifer Science & Technology
Maureen Muldoon, University of Wisconsin – Oshkosh
George Kraft, University of Wisconsin- Stevens Point
Mark Borchardt, Marshfield Clinic Research Foundation
Paul West, The Nature Conservancy
Tim Ehlinger, University of Wisconsin – Milwaukee
Jake Macholl, Wisconsin Wildlife Federation
George Meyer, Wisconsin Wildlife Federation
Sue Swanson, Beloit College
Jake VanderZanden, University of Wisconsin – Madison

Planning and Water Use
Steve Born, University of Wisconsin – Madison
Bob Biebel, Southeast Wisconsin Regional Planning Commission
David Sheard/Jeff Ripp, Wisconsin Public Service Commission
David Denig-Chakroff, City of Madison Water Utility

DEPARTMENT OF NATURAL RESOURCES STAFF TO THE GROUNDWATER ADVISORY COMMITTEE
Jill Jonas, Director, Bureau of Drinking Water & Groundwater
Barb Hennings, Hydrogeologist, Bureau of Drinking Water & Groundwater
Larry Lynch, Hydrogeologist, Bureau of Drinking Water & Groundwater
George Mickelson, Water Supply Engineer, Bureau of Drinking Water & Groundwater
Kathy Mooney, IS Systems Development Services, Bureau of Drinking Water & Groundwater

In addition to the staff above, the following DNR staff provided valuable support to the Groundwater Advisory Committee:
Tim Asplund, Lee Boushon, Bill Furbish, Jeff Helmuth, Mike Lemcke, Judy Ohm, Mark Putra and Mary Ellen Vollbrecht

State of Wisconsin \ GROUNDWATER ADVISORY COMMITTEE

Jim Doyle, Governor

101 South Webster Street
Box 7921
Madison, Wisconsin 53707
FAX 608-267-7650
TDD 608-267-6897

December 14, 2007

To: Senate Committee on Environment & Natural Resources
Assembly Committee on Natural Resources
The Honorable Governor Jim Doyle

On behalf of the Groundwater Advisory Committee, we are pleased to submit this report to the Senate Committee on Environment & Natural Resources and the Assembly Committee on Natural Resources in fulfillment of its charge under 2003 Wisconsin Act 310. We appreciate the opportunity to serve on this important Committee and recognize the significance of Act 310. This report is the second of two reports called for under Act 310.

The first report, submitted at the end of 2006, focused on management of groundwater resources within groundwater management areas and other areas of the state that have already experienced broad impacts due to groundwater drawdown. This report complements the 2006 report and assesses the effectiveness of the law and adequacy of specific provisions in the law.

Overall, the Committee believes Act 310 is working as originally intended as a first step in integrated water management. The law has provided an added level of environmental protection for trout streams, outstanding resource waters, exceptional resource waters and springs by ensuring that potential impacts to these resources be evaluated and reduced as part of the high capacity well approval process.

The Committee reached unanimous agreement on several important issues in 2007 and also worked collaboratively with the DNR to develop Chapter NR 820, Wis. Adm. Code, which was generally endorsed by the Committee. There were also a number of complex issues that simply were not amenable to a unanimous resolution. In those cases, the report contains a number of options prepared by and voted on by Committee members for consideration by the legislature. Resolution of these issues will require additional discussion. We believe the work completed by the Groundwater Advisory Committee over the past two years as reflected in the two reports will serve as a solid foundation for those discussions.

As stated above, Act 310 is a valuable component in ensuring sound management of the State's groundwater resources. However, further work remains to be done to build upon the successes of Act 310. Information collected as the DNR continues its implementation of Act 310 and NR 820 along with ongoing research and monitoring will be essential as enhancements to the regulatory framework are contemplated.

We would be pleased to discuss the enclosed report at a joint meeting of the standing committees. Such a meeting might be valuable for the Committees to enhance their understanding of the recommendations made by the Groundwater Advisory Committee.

Sincerely,

Ron Kuehn, Co-Chair
Groundwater Advisory Committee

M. Carol McCartney, Co-Chair
Groundwater Advisory Committee

Executive Summary

In 2004, the Wisconsin Legislature promulgated 2003 Wisconsin Act 310 to enhance the state's oversight of groundwater quantity issues. The law expanded the authority of the Department of Natural Resources (DNR) to include consideration of impacts to certain valuable surface waters and springs as part of the review of proposed high capacity wells. It also took the first step in addressing regional water quantity issues in Southeastern Wisconsin and Northeastern Wisconsin through establishment of two groundwater management areas in those regions. Act 310 directed the Groundwater Advisory Committee (Committee) to submit reports to the Legislature at the end of 2006 and end of 2007 containing recommendations for how the law should be changed.

This report has been developed and is submitted by the Committee in fulfillment of its charge under 2003 Wisconsin Act 310. In 2007, the Committee focused on assessment of the effectiveness of the law and adequacy of specific provisions in the law. Specifically, Act 310 directed the Committee to consider changes in the regulatory structure related to high capacity wells in groundwater protection areas (within 1,200' of trout streams, outstanding resource waters and exceptional resource waters) in addition to high capacity wells involving high water loss or that could result in significant impacts to springs, as defined in the law. The issues deliberated in 2007 were substantially different than those addressed in the preceding year when the Committee developed recommendations for coordinated management in areas that have experienced both groundwater quality and groundwater quantity issues.

Overall the Committee believes Act 310 is working as originally intended. The law is an effective first step in integrated water management. The Committee was successful in reaching consensus on some issues in 2007. There were a few complex issues that simply were not amenable to a consensus resolution. In those cases, Committee members developed options for submission to the legislature.

The Committee reached unanimous positions regarding the adequacy of the definition of the term, "significant adverse environmental impact" and the regulatory approach applied to wells with a high water loss. In each case, the Committee determined that existing statutory and regulatory definitions and processes are acceptable and that there was no compelling reason to recommend revisions. The Committee also reached consensus on a recommendation concerning the need for a comprehensive statewide water management plan or strategy. While this was not explicitly part of its charge for the year, the Committee determined that it was an important, long-term recommendation representing a critical element in a sound state water management policy.

The Committee considered different approaches to revise the definition of "spring" and formulated a near-unanimous recommendation providing for a deferral of a determination of the threshold flow modification until an updated comprehensive survey of springs is completed. Committee members also developed two additional alternatives for addressing the issues related to springs including; 1) maintaining the existing definition and; 2) reducing the threshold flow requirement.

The Committee also extensively debated the merits of the existing regulatory review process applicable to high capacity wells within groundwater protection areas and the need for enhancement of the current regulatory framework. The Committee was unable to reach unanimous agreement on these issues. Rather, Committee members formulated a number of alternatives that range from maintaining the current structure and review process to suggesting that the system be restructured to provide what some believe to be a greater degree of environmental protection. Other alternatives suggest expansion of the scope of waters protected under the law and expanding the area of a groundwater protection area.

Alternatives based on the concept of adaptive management and the need for a statewide water conservation initiative are also included. The Committee was able to reach near-unanimous agreement regarding a proposal suggesting regular legislative review of the groundwater quantity statutes. Committee members also developed an alternative proposal calling for specific changes to Ch. NR 820.

Both in 2006 and 2007, the Committee identified several issues of immediate need that would improve the ability of the state to implement Act 310. In its 2006 report, the Committee recommended enhancement of the statewide groundwater monitoring network and there was general agreement in 2007 that the DNR should initiate a process to update available information concerning springs. The Committee expressed general support for efforts by the DNR to reallocate existing appropriations in order to fund these activities as long as adequate funds remain available to meet future needs related to assistance to local governments. The proposed alternatives contained in this report have varied degrees of funding implications. Some would require substantial increases in DNR resources while others would have minor or no fiscal impact. If the legislature pursues any of the Committee's proposals as part of future legislation, detailed consideration of fiscal estimates and possible alternative funding sources would take place at that time.

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List of Acronyms

AG – Agriculture
cfs – Cubic Feet per Second
DNR – Department of Natural Resources
ENV – Environment
ERW – Exceptional Resource Water
GAC – Groundwater Advisory Committee
GAA – Groundwater Attention Area
GMA – Groundwater Management Area
GPA – Groundwater Protection Area
gpm – Gallons per Minute
IND – Industrial
LTE – Limited Term Employee
MUN – Municipal
ORW – Outstanding Resource Water
WD – Well Drilling
WEPA – Wisconsin Environmental Policy Act
WGNHS – Wisconsin Geological & Natural History Survey
WWF – Wisconsin Wildlife Federation

Chapter 1: Introduction

1.1 Background

On April 22, 2004 Governor Doyle signed a new groundwater protection law, 2003 Wisconsin Act 310, (Appendix A) that expands the State's authority to consider environmental impacts of high capacity wells and takes the first step in addressing regional water quantity and quality issues in Southeastern Wisconsin and the Lower Fox River Valley. The law was the result of bipartisan cooperation in the legislature and collaboration by a wide and diverse array of stakeholders.

The Act addressed two main issues. First it created two separate groundwater management areas in Southeastern Wisconsin and in Northeastern Wisconsin along the Lower Fox River Valley. These two areas are centered on and include Waukesha and Brown Counties, and the surrounding cities, villages and towns. They are areas of concentrated urban development where related extensive groundwater pumping has caused the water level of the deep sandstone aquifer to drop more than 150 feet since predevelopment. In addition, there is also concern that besides simply lowering the level of the groundwater in these areas, the drawdown has induced water quality issues related to arsenic, radium and other parameters and is resulting in diminished surface water flows. The Department of Natural Resources (DNR) delineated the area encompassed within each of these areas in Chapter NR 820, Wis. Adm. Code, which became effective on September 1, 2007.

The second primary component of Act 310 expanded the state's scope of authority over high capacity wells to include environmental factors in addition to impacts on public water utilities. Recognizing that groundwater and surface water are often connected, the law requires the DNR to consider impacts to trout streams, springs, outstanding resource waters and exceptional resource waters and impacts from wells with high water loss. Chapter NR 820, Wis. Adm. Code, (Appendix B) established the review processes and approval criteria applied to high capacity wells within groundwater protection areas, wells that involve high water loss or wells that could have significant environmental impacts on a spring.

The Act also established a Groundwater Advisory Committee (Committee). Members of the Committee were appointed by the Governor and leaders from both the State Senate and State Assembly. The Committee includes members representing municipal, environmental, agricultural and industrial interests and it also includes representatives from the well drilling industry and the DNR. The Committee was directed to consider the new law and formulate reports pertaining to the main elements of the law as described above. The first report, submitted at the end of 2006, contains extensive recommendations related to management of groundwater in GMAs. The 2006 report is available at http://dnr.wi.gov/org/water/dwg/gac/GACFinalReport1206.pdf. This 2007 report addresses the scope of the existing high capacity well regulation.

1.2 Legislative Charge and Committee Procedures

Pursuant to Act 310, the Committee is required to submit a report to the legislature's environmental standing committees by December 31, 2007. The Committee is directed to assess the effectiveness of Act 310 and its subsequent implementation by the DNR (Appendix C). Based on that evaluation, the Committee is expected to formulate recommendations concerning modifications to the program implementation and necessary legislative changes. The law identified the following issues to be addressed in the 2007 report from the Committee:

1. Recommended changes in the regulation of high capacity wells that are in groundwater protection areas, that have a water loss of 95 percent or more, or that have a significant environmental impact on a spring.
2. The definition, as created in Act 310, of a spring.
3. Management strategies that permit adaptation of the regulation of high capacity wells as relevant information becomes available or groundwater conditions change.
4. The potential use of general permits for high capacity wells.
5. Factors the DNR should consider in rules used to determine whether a high capacity well causes a significant environmental impact.

The Committee has met regularly since April 2005. For detailed information concerning Committee organization, meetings and supporting information refer to http://dnr.wi.gov/org/water/dwg/gac/index.htm.

Overall, the Committee believes that Act 310 is working as originally intended as an effective first step in integrated water management. The following sections present the results of the Committee's discussions pursuant to the legislative charge. The Committee reached unanimous agreement on several issues, including the adequacy of the term "significant adverse environmental impact", the regulatory approach applied to wells with high water loss and the need for a comprehensive statewide water management plan. In those cases where the Committee was unable to reach unanimous agreement, Committee members developed and voted on alternative proposals for submission to the legislature. Each of those proposals, as developed by Committee members, is presented in this report.

The order in which alternative proposals are presented reflects the level of support each received in the Committee's voting process. Within each section, the proposals are presented in descending order of support, as indicated by the tally of votes. The outcome of the vote for each alternative follows the discussion and presentation of the alternative proposal. As shown in the voting results, the affiliation of each Committee member is abbreviated as follows:

Agriculture – (AG)
Environment – (ENV)
Industrial – (IND)
Municipal – (MUN)
Well Drilling – (WD)
Department of Natural Resources – (DNR)

In the one situation where related alternatives received the same vote, the first discussion presented is that which proposes to retain the existing regulatory framework, followed by the alternative that proposes revision of the current approach (sections 2.2.1 and 2.2.2). The two proposals received the same level of support by the Committee members and the order of presentation should not be interpreted as an expression of preference by the Committee.

1.3 General Water Policy Matters

The Committee considered two proposals that related more to general statewide water policies rather than specific issues concerning implementation of Act 310. Those policy proposals are discussed in the following sections.

1.3.1 Unanimous Recommendation on Need for Coordinated Statewide Water Policy

As the Committee carried out its charge, it became evident that issues addressed by the Committee significantly overlapped with other water policy initiatives. In particular, concurrent efforts focused on Great Lakes management, water conservation, and source water protection and well construction rule revisions are closely related to issues under consideration. Committee members emphasized the need for sufficient coordination and consistency. To address these concerns, the Committee unanimously endorsed the following recommendation:

DISCUSSION:
Numerous water management discussions are taking place in Wisconsin. This includes discussions about high capacity wells and groundwater quantity, the Great Lakes Compact, water conservation, source water protection and well construction. The Groundwater Advisory Committee believes it is important that decisions on these issues be consistent, complementary, and further good water management in Wisconsin.

RECOMMENDATION:
To that end, the Groundwater Advisory Committee recommends that as the State develops water management legislation, that it concurrently develop a comprehensive statewide water management policy. The policy should establish a vision and priorities for the long-term management of the state's groundwater and surface water resources. This policy should:

- *balance competing water uses, including environmental protection;*
- *rely on sound science and the principles of adaptive management;*

- *encourage efficient water use while discouraging waste;*
- *provide for coordination among state and local government agencies; and*
- *seek to ensure adequate water supplies for future generations.*

The Groundwater Advisory Committee also recommends that changes made to the groundwater law be consistent with and made in the context of this statewide water management policy.

1.3.2 Proposal on Water Conservation (Committee Vote: Yes (8); No (4); Abstain (2))

Water conservation is another broad policy concept considered by the Committee. The proposal below includes provisions that apply specifically to high capacity wells but also are applicable to all users of water in the state.

PROPOSED RECOMMENDATION:
Consistent with the Committee's support for a comprehensive statewide water management policy and recognition of the value of increased conservation and efficiency measures in areas of the state requiring special consideration, like the Groundwater Management Areas and Groundwater Protection Areas, we recommend to the Legislature as follows:

That the Legislature authorize the development and implementation of a coordinated statewide water conservation program that:

- *evaluates the value of conservation practices for high-capacity well approval holders within GPAs or near protected springs;*
- *requires the demonstration of conservation and best management practices for all high capacity well approval holders within designated Groundwater Management Areas (GMAs) and Groundwater Attention Areas (GAAs).*
- *identifies Wisconsin's water management and conservation goals and objectives for both groundwater and surface water;*
- *identifies strategies to achieve these goals and objectives consistent with other statewide water conservation planning efforts, including identification of existing legal impediments to conservation;*
- *provides for implementation of recommended measures and practices through development of administrative rules, with public input.*

YES: Ambs(DNR), Dantoin(AG), Duchniak(MUN), Graham(ENV), Habush Sinykin(ENV), Hahn(IND), McCartney(IND), Nauta(MUN) - (8)

NO: Carter(AG), Gross(ENV), Kuehn(AG), Meyers(WD) - (4)

ABSTAIN: Holdener(IND), Kobza(MUN) - (2)

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Chapter 2: Groundwater Protection Areas

2.1 Existing Framework and Background

Act 310 is predicated on an assumption that excessive pumping of groundwater can contribute to significant environmental impacts to surface water resources and springs. In an effort to define and limit the scope of the law, the legislature created the concept of a groundwater protection area. The term, groundwater protection area, is defined in s. 281.34(1)(a), Stats., as follows:

> "Groundwater protection area" means an area within 1,200 feet of any of the following:
>
> (a) An outstanding resource water identified under s. 281.15 (http://folio.legis.state.wi.us/cgi-bin/om_isapi.dll?clientID=37724113&infobase=stats.nfo&jump=281.15&softpage=Document - JUMPDEST_281.15)that is not a trout stream.
>
> (b) An exceptional resource water identified under s. 281.15 (http://folio.legis.state.wi.us/cgi-bin/om_isapi.dll?clientID=37724113&infobase=stats.nfo&jump=281.15&softpage=Document - JUMPDEST_281.15) that is not a trout stream.
>
> (c) A class 1, class 2, or class 3 trout stream, other than a class 1, class 2, or class 3 trout stream that is a farm drainage ditch with no prior stream history as identified under sub. (8)(a).

In adopting this approach, the legislature established categories of water bodies that are protected and created a setback distance for siting high capacity wells. Figure 1 illustrates the groundwater protection areas in the state.

Waters designated as outstanding resource water (ORW) or exceptional resource water (ERW) are surface waters which provide outstanding recreational opportunities, support valuable fisheries, have unique hydrologic, geologic features, have unique environmental and or cultural value, and are not significantly impacted by human activities. At the present time, 366 water bodies have been designated as ORW and 1,539 are designated as ERW. These water bodies and their respective designations are specified in Ch. NR 102, Wis. Adm. Code, and are intended meet federal Clean Water Act obligations requiring Wisconsin to adopt an "anti-degradation" policy.

Currently, there are over 10,000 miles of designated trout streams in the state consisting of specific segments or the entire length of over 2,900 streams. These include 4,136 miles of Class 1 trout streams, those high quality streams with self-sustaining populations, and 4,644 miles of Class 2 trout streams, streams with some natural reproduction, but which depend on stocking to maintain a desirable sport fishery. Trout streams designated in the DNR's most recent trout stream publication, Wisconsin Trout Streams (PUB-FH-806 2002, PDF, 1,035KB), are considered for protection under Ch. NR 820, Wis. Adm. Code.

The statute requires that any high capacity well proposed to be located within a groundwater protection area may not be approved by the DNR unless it is determined that the well will not result in significant environmental impact. High capacity wells proposed within groundwater protection areas are subjected to an additional level of review, beyond the typical well construction details, to assess potential environmental impacts. The review process as delineated in Chapter NR 820, Wis. Adm. Code, includes screening criteria to help identify which of those proposed high capacity wells are unlikely to result in significant environmental impact and as a result can be approved without an extensive environmental review.

2.1.1 High Capacity Well Approval Process

A high capacity well is any well that, together with all other wells on a single property has the capacity to withdraw at least 100,000 gallon per day. Individual high capacity wells can be used for a variety of purposes including irrigation, industrial uses, drinking water, fire suppression and construction site dewatering and can also display a large variability in pumping capacity, ranging from a few tens of gallons per minute to over 1,000 gallons per minute.

A high capacity well must be approved by the DNR before the well is constructed. Applicants pay a fee of $500 and submit information about the proposed well on forms provided by the DNR. The information provided relates to how the proposed well is intended to be constructed and also includes available information pertaining to other wells on the property. In 2005 and 2006, there were 480 applications for approval submitted. Of these applications, the DNR

issued 451 approvals and there were 369 new high capacity wells actually constructed. Figure 2 shows the distribution throughout the state of the new high capacity wells constructed in 2005 and 2006.

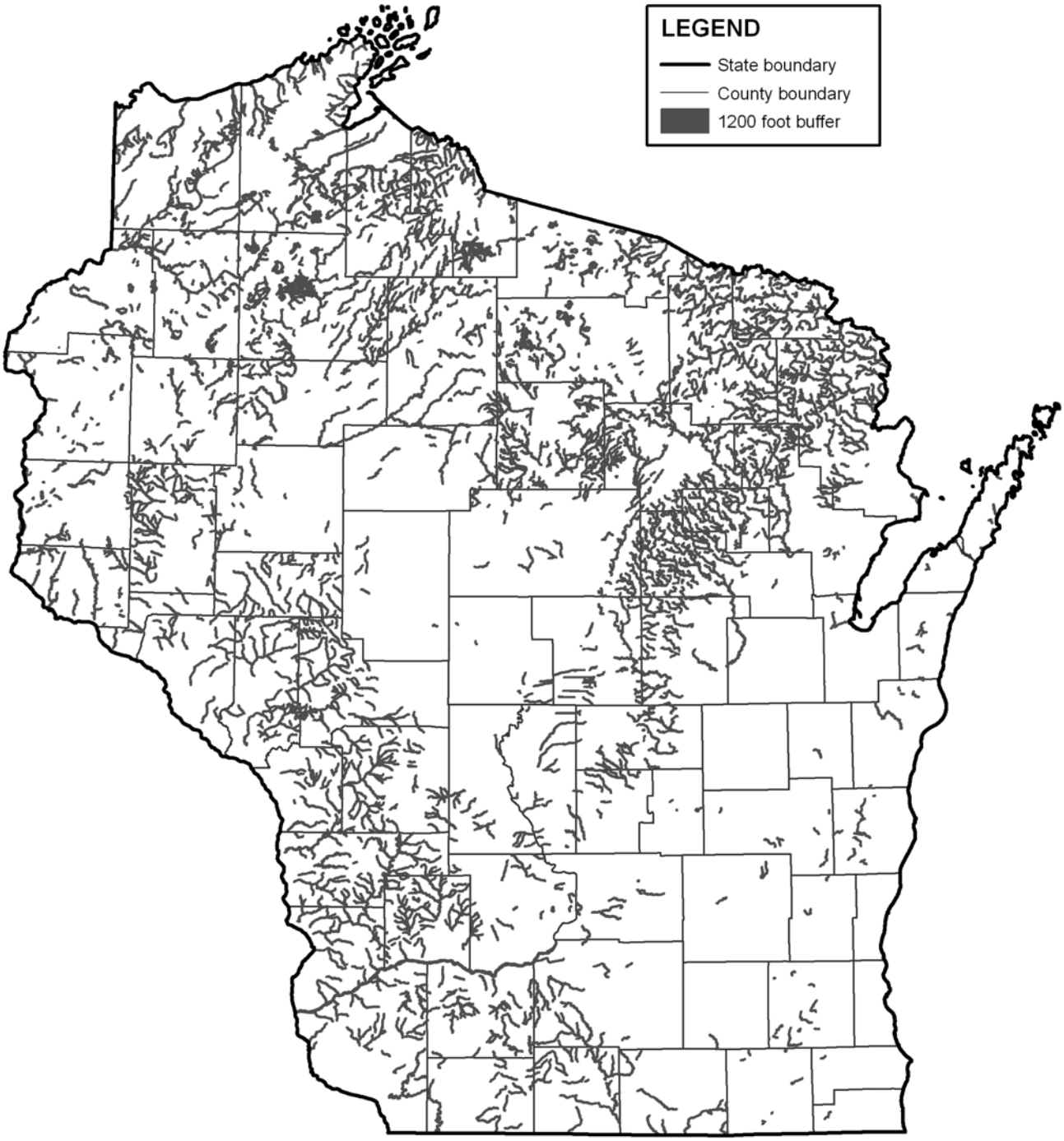
Prior to the enactment of Act 310, the reviews of high capacity well applications primarily entailed review of the proposed well to determine whether it would comply with the construction and locational criteria contained in Ch. NR 812 and Ch. NR 811, when applicable, including consideration of potential contaminant sites in relation to the proposed well. In addition, proposed wells were reviewed to determine whether they might impair the water supply of a public utility. If significant impacts were predicted, the approval would be denied or conditioned appropriately to ensure protection of the public utility's water supply.

With the passage of Act 310, the review process for high capacity wells was expanded. In addition to the steps described above, a proposed well is also reviewed to determine whether it is within a groundwater protection area. Upon receipt of a high capacity well application, notification is sent to DNR regional staff soliciting their knowledge of any sensitive natural resources in the vicinity of the proposed well. Additional review is completed for proposed wells located within a groundwater protection area to assess whether the proposed well could result in significant impacts to a trout stream, ORW or ERW.

Chapter NR 820 establishes processes and criteria to guide the review of proposed high capacity wells that are located within a groundwater protection area. It was drafted in late 2006 and early 2007 and became effective on September 1, 2007. The DNR worked with the Committee to develop a rule that was a consensus product meeting all requirements of Act 310. Members of the Committee testified before the Natural Resources Board in support of the rule.

Chapter NR 820 includes screening criteria to determine the necessary level of environmental review. With information provided by the applicant, the DNR uses accepted analytical methods and available geologic and hydrogeologic information to estimate the potential impact of the proposed well on the designated water. In cases where there is not reliable site-specific information concerning aquifer characteristics or stream flow, DNR staff use conservative assumptions in the preliminary analyses or require the applicant to collect the necessary site specific information. If it is determined that a proposed well could result in a significant adverse environmental impact, the well application can either be denied or the applicant may be required to submit additional environmental information. The DNR will prepare an environmental assessment prior to approving or denying the proposed well. The rule specifies that all approvals for high capacity wells within groundwater protection areas or near springs must include conditions to ensure that construction and operation of the well will not result in significant adverse environmental impact. The DNR has the authority to require an owner to monitor groundwater and surface water as part of the high capacity well approval and may revise an approval based on the results of the monitoring program.

Act 310 and Chapter NR 820 contain parallel provisions relating to the review and approval of high capacity wells that serve a public utility supplying water to the public. The criteria for approval of public utility wells differs from the process applicable to other high capacity wells. In the case of a public utility well within a groundwater protection area, the applicant must demonstrate either that the well will not result in a significant adverse impact to protected waters, or that there is no other reasonable alternative location for the well. If the public utility demonstrates that the well will not result in a significant adverse impact to protected waters, the well is to be approved in the same manner as a private high capacity well, and the DNR is to condition its approval to ensure that adverse environmental impacts do not result. If the public utility demonstrates that there is no other reasonable alternative location for the well and the DNR concurs with that demonstration, the well may be approved even though it may result in a significant adverse impact, provided the approval contains conditions to ensure that the environmental impact of the well is balanced by the public benefit of the well as it relates to public health and safety. As with private high capacity wells, the DNR has the authority to subsequently modify the approval if unexpected impacts develop.



Notes: Includes trout streams with no prior stream history. The list of exceptional and outstanding resource waters was revised during 2006.

Figure 1. Groundwater Protection Areas

2.1.2 Wells Approved within Groundwater Protection Areas

Since adoption of Act 310 the DNR has received a number of high capacity well applications requesting approval to construct a well within a groundwater protection area. In some cases, through discussion with the applicant, the proposed location was eventually adjusted so that the proposed well was no longer within a groundwater protection area or the application was withdrawn. In the 2-1/2 years since adoption of the law, the DNR has approved 16 high capacity well applications within GPAs. Within those applications, 26 wells were approved. (A number of applications requested approval for multiple wells.) Fourteen (14) new high capacity wells have been constructed within groundwater protection areas (Figure 3). All of these wells were reviewed and approved before Chapter NR 820 went into effect on September 1, 2007.

The wells approved within GPAs have various uses and pumping capacities. The proposed pumping capacity of the 26 new high capacity wells approved for construction in groundwater protection areas ranged from 15 gallons per minute (gpm) to 1,250 gpm. Wells with low pumping capacity and wells that were anticipated to be used on a sporadic basis were determined to have very little chance of resulting in significant impact. These wells included wells intended for potable use at campgrounds and schools, fire suppression and temporary dewatering purposes.

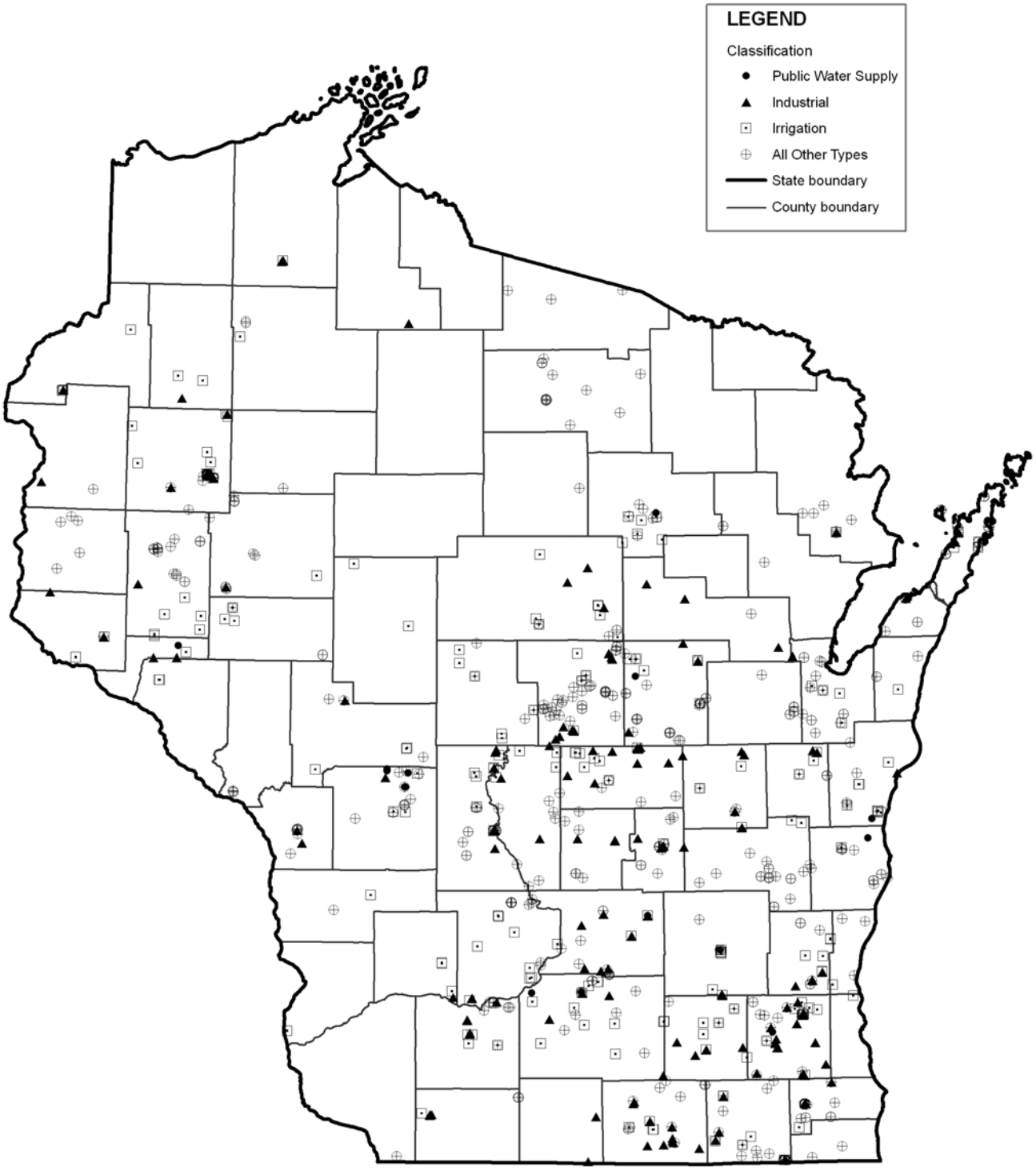
In cases where the requested pumping capacity and intended use of the proposed well had potential for significant environmental impact, DNR staff reviewed the proposed well in conformance with the standards of Act 310 and applied an evaluation approach that was consistent with the provisions ultimately incorporated into Chapter NR 820. Given that these approvals were processed before NR 820 became effective, DNR staff did much of the analysis rather than relying on information submitted by the applicant. Staff estimated the potential impact to the nearby surface water body using basic analytical techniques and then reviewed that information in the context of the flow regime of the stream to form an initial opinion regarding the significance of potential impacts. Typically, this would involve a site inspection by DNR staff. If the impacts were deemed to be potentially significant, staff placed conditions on the well approval to minimize the impacts. For the irrigation wells approved, this normally entailed reducing the requested daily or monthly pumpage amount, and reducing the approved maximum daily or monthly pumpage from other previously approved wells on the property by an amount equal to or greater than the pumping capacity for the new well. Under this approach, approval of the proposed well would not result in significant impacts to the nearby surface water body and in some cases actually increased the amount of water theoretically available to the stream. In addition, high capacity well approvals for new irrigation wells near trout streams have also included restrictions on when the well could be operated to ensure there was adequate stream flow during times of the year when trout would be particularly sensitive to reductions in flow.

DNR staff is currently reviewing three applications for wells within a groundwater protection area using the provisions of Chapter NR 820. Applicants have been instructed to collect additional site-specific information to support their applications and facilitate DNR review in accordance with Ch. NR 820. Decisions on each of these applications are pending and will be completed following receipt and review of the additional information necessary to conduct the review.

2.1.3 Assessment of Effectiveness of Act 310 to Date

One purpose of Act 310 was to ensure protection of some of the state's highest quality and valued surface waters. This would be accomplished in two ways. First, by creating groundwater protection areas, applicants for high capacity wells would take steps to avoid siting new wells in close proximity to a sensitive surface water body. Second, an environmental review process was adopted to ensure significant adverse environmental impacts would not result for those wells constructed within a groundwater protection area.

It is difficult to quantitatively review the effectiveness of Act 310 due to a lack of high quality data concerning the precise location of high capacity wells constructed before 2005. While DNR has documented the locations of wells relative to trout streams, ORW and ERW for wells proposed since 2005, such information is not available for



Note: Symbols are not to scale.

Figure 2. High Capacity Well Approvals Issued in 2005 and 2006.

wells constructed prior to 2005. Further, for those wells (other than public utility wells) constructed prior to 2005, there is little to no monitoring information available to document the extent of impacts, if any, caused by those wells. Given these data limitations, an evaluation of effectiveness will by necessity be qualitative in nature.

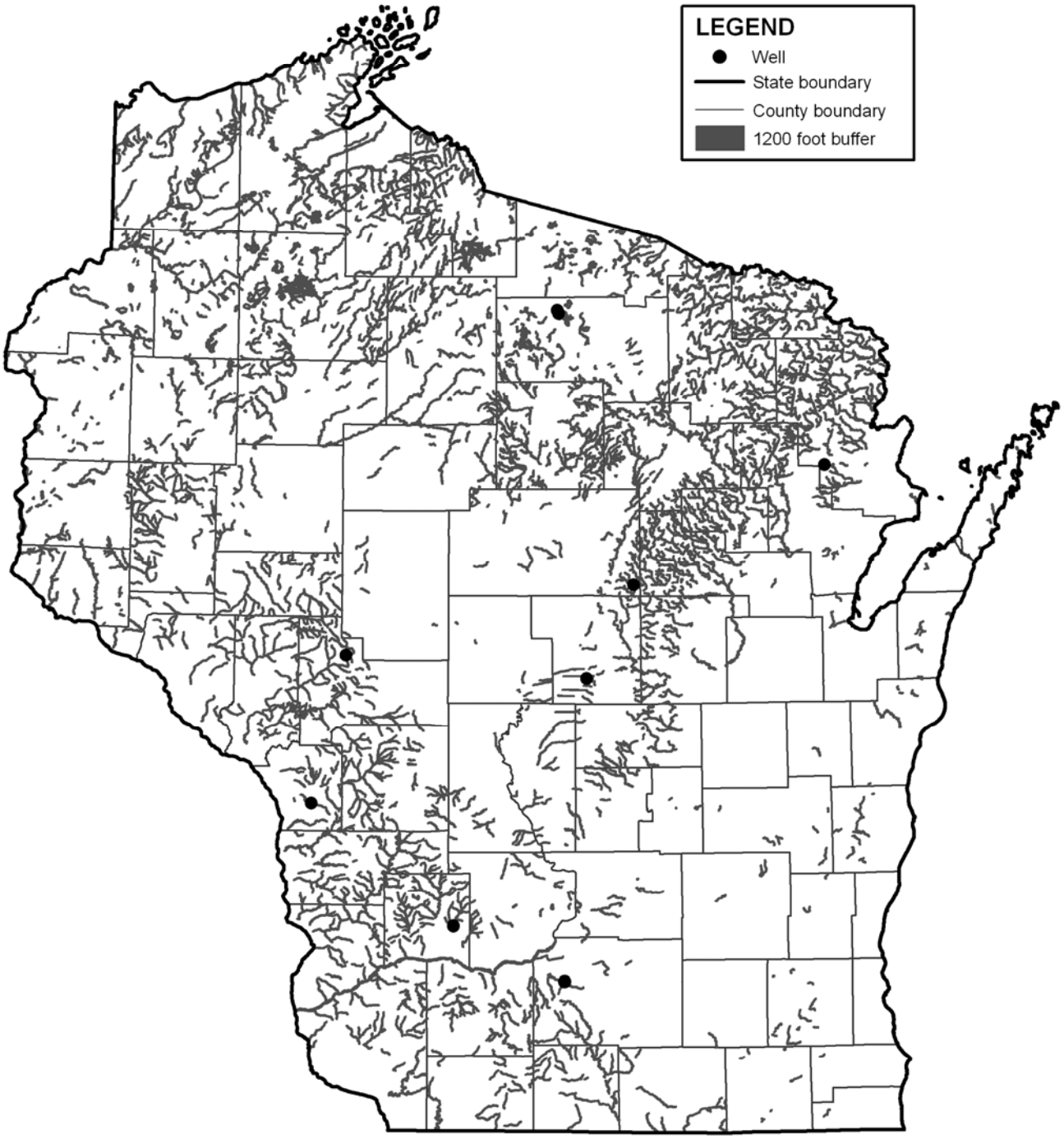
For the wells approved within a GPA, the law appears to be an effective tool for reducing impacts to the potentially affected surface water. In the absence of Act 310, the wells within GPAs approved since 2005 would have likely been approved at the requested pumping capacities and pumping schedules without modification of either the proposed well or other wells on the property. While the magnitude of the potential impact is difficult to quantify with certainty, it is reasonable to assume that some negative impacts were avoided.

The DNR reported information that well drillers, who are responsible for preparation of the vast majority of high capacity well applications on behalf of landowners, are proactively encouraging landowners to avoid siting new high capacity wells within groundwater protection areas. As part of its continuing education activities, DNR trained members of the well drilling industry on the new law and encouraged the drillers to avoid siting high capacity wells within groundwater protection areas. Data collected since 2005 demonstrates that most high capacity wells are being located well beyond 2000 feet from trout streams, ORW and ERW. Of the 336 applications for high capacity wells approved in 2005 and 2006, 56 wells were constructed within 2000 feet of a trout stream, ORW or ERW. The data also shows that there has not been a concentration of wells located just outside the boundaries of a GPA, which was a concern expressed at the time Act 310 was being developed. This further suggests that positive efforts are being made to avoid siting high capacity wells in close proximity to GPA waters.

A final way to evaluate the effectiveness of Act 310 in protecting valuable surface waters is to consider whether any instances have been documented of significant environmental impacts to a trout stream, ORW or ERW as a result of approval of any high capacity well since adoption of Act 310. To date, no such cases have been brought to the attention of the Committee or the DNR. Given the lack of site-specific environmental monitoring in the vicinity of high capacity wells, this cannot be interpreted as conclusive proof that no such impacts are occurring. However, it is also reasonable to assume that if significant impacts were developing in trout streams, outstanding resource waters or exceptional resource waters, the DNR, other public agencies, researchers and the general public would be aware of their occurrence.

Heightened awareness of the issues addressed under Act 310 was an important factor in advancing protection of Cook Creek, a small Class 1 trout stream in Vernon County. Beginning in 2004, residents in the area noticed that portions of the stream would stop flowing periodically and that these periods of reduced flow correlated to times when a nearby quarry was using its high capacity well. The high capacity well is located about 350 feet from the stream. It was initially constructed in 1994 and later deepened in 1999 and is in compliance with DNR approvals. After conducting preliminary reviews of the well construction and other available geologic information, local and state agency personnel approached the quarry owner, Kraemer Company, to discuss the situation. Kraemer Company gave permission to the Wisconsin Geological & Natural History Survey (WGNHS) to investigate the possible link between the reduction in stream flow and operation of the well. WGNHS placed probes and other equipment into the well to determine the flow conditions near the well. The research revealed that the high capacity well was drawing water from an upper aquifer through a fracture zone, thereby lowering the normal water table and effectively draining portions of Cook Creek. The quarry owner voluntarily agreed to reconstruct the well by extending the well casing through the upper fracture zone and grouting the casing in place. Monitoring of the site following well reconstruction indicated that the flow in Cook Creek remained steady and was unaffected by groundwater withdrawal from the quarry well. Since this well was constructed prior to enactment of Act 310, its location relative to the trout stream was not considered as part of the approval process. This site would have been eligible for mitigation under the provisions of Act 310, but formal mitigation action was avoided due to the voluntary collaboration on the part of the owner. It shows that with cooperation of private citizens, well owners, and local and state agencies positive results can be obtained and environmental protection can be achieved to the satisfaction of all parties.

Insofar as Act 310 focused on protecting specified surface water resources (trout streams, outstanding resource waters and exceptional resource waters) from newly constructed high capacity wells, it appears to be effective. There is no



Note: Some points represent multiple well locations

Figure 3. High Capacity Wells Constructed in Groundwater Protection Areas in 2005 and 2006.

evidence that it is not working as intended. The related, but clearly different, question of whether the level of environmental protection provided under Act 310 should be expanded will be addressed in later sections.

2.2 Groundwater Protection Area Options

The Committee had extensive discussions concerning the need to change the existing regulatory concept of groundwater protection areas. The discussions were centered around two aspects of the current approach: 1) the appropriateness of defining a groundwater protection area on a distance of 1,200 feet and; 2) the appropriateness of limiting designation of groundwater protection areas to trout streams, ORW and ERW.

Committee members had divergent opinions regarding the need to amend the distance criteria for defining the extent of groundwater protection areas. Some Committee members maintained that specifying increased environmental review only for wells within a specific distance from designated waters is a reasonable balance, providing increased environmental protection while also providing a clear criteria for the regulated community to consider as proposals for new high capacity wells are developed. Essentially, applicants understand where they can site a high capacity well without the need for environmental review and, conversely, if they choose to site a well within the specified distance for a groundwater protection area they know they may not receive approval of the well as requested. Conversely, it was discussed that reliance on a specified distance as the only criterion to determine which proposed wells undergo an environmental review is not based on sound scientific principles. Other Committee members maintained that some high capacity wells located beyond the 1,200' boundary could have substantial potential to cause adverse impacts to surface waters and therefore the 1,200' criterion might provide inadequate protection to the nearby surface water.

Similarly, there were differing views on the extent of surface water resources included under groundwater protection areas. The Committee considered DNR information related to lake classification systems and designation systems currently in place for other surface waters. These systems are based on such criteria as presence of threatened and endangered species, fishery value, unique habitat and other natural resource attributes of the surface water. There was considerable discussion concerning falling lake levels in certain seepage lakes in the state and the potential link to pumping of high capacity wells in the area and drought conditions. A majority of Committee members believe the limited scope of waters included in Act 310 is appropriate at this time. They maintain that the specified waters represent the highest value waters in the state and, as such, are appropriate for designation of groundwater protection areas. Other Committee members believe that the scope of environmental protection afforded under the existing framework is insufficient and that the waters considered as part of the review of a proposed high capacity well should not be limited to trout streams, ORW and ERW.

The Committee was unable to reach consensus on these issues. Committee members were divided on the need to modify the existing groundwater protection framework as well as the extent of modification necessary. The proposed options discussed in the following sections were formulated by members of the Committee and discussed by the entire Committee. No proposal received a majority of favorable votes from Committee members. Since they do not represent the view of the Committee as a whole, all proposed options are presented for consideration by the legislature.

2.2.1 GPA Proposal to Maintain Existing Regulatory Framework (Committee Vote: Yes (6); No (8))

The following proposal is based upon the view that Act 310 represents compromise legislation which increased environmental protection of trout streams, outstanding resource waters and exceptional resource waters from impacts caused by high capacity wells, while at the same time providing well owners of certainty regarding its application. This proposal recommends that no changes in the existing regulatory approach for delineating groundwater protection areas be made at this time.

DISCUSSION

Act 310, Laws of 2003 provides that the DNR may not approve a high capacity well located in a groundwater protection area unless it is able to include and includes in the approval conditions, which may include conditions as to location, depth, pumping capacity, rate of flow, and ultimate use, that ensure that the high capacity well does not cause significant environmental impact.

A "groundwater protection" ("GPA") is defined to mean an area within 1,200 feet of any of the following:

(i) An outstanding resource water (see Section 281.15).

(ii) An exceptional resource water (see Section 281.15)

(iii) The Class I, II, or III trout stream (as identified by the Wisconsin DNR).

The one exception to this rule is for a high capacity well that is a water supply for a public utility engaged in supplying water to or for the public. For a public water supply well, the DNR may allow a high capacity well to be constructed even though it may cause a significant environmental impact to a GPA if the DNR (a) determines that there is no other reasonable alternative location for a well, and (b) is able to include and includes in the approval conditions that ensure that the environmental impact of the well is balanced by the public benefit of the well related to public health and safety.

High capacity wells that are not public water supply wells may not be constructed in any case if the well would cause a significant environmental impact to a GPA. In other words, high capacity wells that are not public water supply wells, regardless of their need or usefulness, are banned in GPAs if they would cause a significant environmental impact to a GPA.

During the course of the GAC's analysis of the operation of Act 310, we learned the following:

- *That the 1,200 foot limit, while providing significant protection to the surface waters affected by the limit, has no basis in science. The 1,200 foot limit was the result of a consensus by affected interest groups and the Wisconsin Legislature when the law was passed in 2003.*

- *That property owners have been encouraged by the DNR not to seek approval for a high capacity well within the 1,200 foot limit.*

- *That since May 2005, the DNR has approved the construction of 16 high capacity wells within GPAs.*

PROPOSED RECOMMENDATION:
We recommend that the 1,200 foot limit provision of current law be retained at this time.
Current law in essence creates a water use priority system. High capacity wells (other than public water supply wells) that cause a significant environmental impact to a GPA are banned within that GPA. Stated conversely, this means that GPA surface waters are granted priority over high capacity wells (other than public water supply wells) within the 1,200-foot GPA area.

This de facto priority system should not be extended beyond the 1,200 foot limit contained in current law without further discussion about the relative uses of water and how to balance conflicting demands on Wisconsin water resources. If further protections beyond 1,200 feet are to be considered, those protections should be considered in the context of or weighed against the benefits of the high capacity well to the property owner, the locality and the State of Wisconsin. Further protection should not be handled by simply extending the ban on high capacity wells that may cause a significant environmental impact to a GPA without first engaging in this balancing discussion.

YES: Carter(AG), Hahn(IND), Holdener(IND), Kobza(MUN), Kuehn(AG), Meyers(WD) - (6)

NO: Ambs(DNR), Dantoin(AG), Duchniak(MUN), Habush Sinykin(ENV), Graham(ENV), Gross(ENV), McCartney(IND), Nauta(MUN) - (8)

2.2.2 GPA Proposal for Hydrogeologic Analysis of All High Capacity Wells (Committee Vote: Yes (6); No (8))

The following proposal is based on the concept that designation of groundwater protection areas based on an arbitrary distance, such as 1,200 feet, does not reflect sound scientific methods in that the existing approach ignores the

influence that site-specific geologic and hydrogeologic conditions can have in determining the significance of impacts. This proposal recommends that all high capacity wells be subjected to review based on geologic and hydrogeologic analyses to assess the proposed well's potential impacts on nearby surface resources.

DISCUSSION:
Groundwater pumping from high capacity wells continues to impact water levels and flows in Wisconsin lakes, springs, streams, and wetlands, with increasing ecological and economic ramifications. For example, in Wisconsin's central sands region, groundwater models assessing declining lake and river levels increasingly implicate nearby high capacity wells as a cause of the region's declining water levels. In burgeoning southeastern Wisconsin, disputes between lake property owners and municipal utilities related to lake level concerns are continuing to increase in number and frequency. Likewise, concerns over declining lake levels in the northeast and northwest portions of the state will surely be compounded if drought conditions continue as they have.

In the years to come, the extent of these groundwater impacts on even the most prized of Wisconsin's waters—those designated Exceptional Resource Waters (ERWs), Outstanding Resource Waters (ORWs) and Trout Streams—will undoubtedly increase for the reason that (1) Wisconsin lacks a comprehensive program for measuring and assessing groundwater-surface water impacts, and (2) Wisconsin accomplishes few, if any, assessments of the impact of specific wells upon nearby water resources.

Basing the definition of a Groundwater Protection Area (GPA) solely on a pre-defined distance from the protected resource—like the 1200 feet currently provided under the statute—fails to take into account any of the other critical hydrogeologic and scientific parameters that require consideration in order to prevent adverse impacts on surface water resources from groundwater pumping.

Without hydrogeologic information as a guide, the extent and degree of the proposed high-capacity well's impact cannot be predicted. The distance of a well from a protected resource is just one of many parameters that affect its impact on water resources. Other factors that are at least as important as distance include hydraulic conductivity and the connection between groundwater and the protected surface water resource. Indeed, even the simplest of models includes parameters other than distance. As such, an arbitrary, pre-defined distance like the 1200 foot distance provided under the statute is not an appropriate regulatory means to ensure the protection of designated water resources.

A more appropriate, rational and science-based regulatory approach would help assure fairness for all applicants and would not be significantly different from what DNR currently does. Such a process would enable a detailed hydrogeologic review process, as outlined by Jill Jonas in her September 11th GAC presentation and by Ken Bradbury in his July 10th GAC presentation, which would allow the DNR to take into account key factors beyond mere distance, such as aquifer parameters, estimated drawdown, and other estimated surface water impacts. [reference: http://www.dnr.state.wi.us/org/water/dwg/gac/meetings.htm]. Finally, a science-based approach will allow the DNR-approval process to be both flexible and firm in protection of this resource.

PROPOSED RECOMMENDATION:
Designation of Groundwater Protection Areas (GPAs) should not be limited to a pre-defined distance from a protected surface water body as is currently provided under the statute.
In place of the arbitrary distance provided under the statute, the Department shall utilize an articulated, rational process based upon a hydrogeologic analysis that evaluates the potential impact of a proposed high-capacity well on near surface water resources and identifies opportunities for mitigation.

YES: Dantoin(AG), Habush Sinykin(ENV), Graham(ENV), Gross(ENV), McCartney(IND), Nauta(MUN) - (6)

NO: Ambs(DNR), Carter(AG), Duchniak(MUN), Hahn(IND), Holdener(IND), Kobza(MUN), Kuehn(AG), Meyers(WD) - (8)

2.2.3 GPA Proposal on Expanded GPA (Committee Vote: Yes (5); No (8); Abstain (1))

The following proposal was developed as an attempt to increase the level of environmental protection provided for protected waters while at the same time retaining the concept of a specifically-defined groundwater protection area. It is based on an assumption that wells with a large pumping capacity have the potential to cause impacts to surface waters at a greater distance than wells with small pumping capacity. This proposal recommends that groundwater protection areas be expanded to 4,000' around a trout stream, outstanding resource water or exceptional resource water and also proposes a method to determine which proposed high capacity wells may be approved without conducting extensive environmental review.

DISCUSSION:
Presently, groundwater protection areas are defined by a specified distance from a designated water body. This approach provides the regulated community a clear line of demarcation when submitting high capacity well applications. Applicants have a sense of certainty that their proposed well will be approved if sited outside of a groundwater protection area. Conversely, they also know that if the well is located within a groundwater protection area, additional review will be necessary. Although the well may still be approved, or approved with conditions, it is also possible that it may be denied to ensure protection of the surface water.

It has been argued that the current criteria of 1,200' is too close and that high capacity wells can cause significant adverse impacts to surface waters even if the wells are located outside of the groundwater protection area. For that reason, it has been suggested the existing framework be abandoned and that all applications for approval of high capacity wells be reviewed to determine if impacts to sensitive water resources could result. If there is potential for significant impacts to occur, additional data collection could be required and a more comprehensive environmental review would be conducted as part of the approval process.

PROPOSED RECOMMENDATION:
The following proposal is intended to strike a balance between the two approaches. Its basic components include:

- *Increase the GPA distance to 4,000'*
- *Retain the current scope of protected waters (trout streams, ORW and ERW)*
- *Retain the existing screening criteria in Ch. NR 820*
- *Add another screening mechanism to initially identify those proposed wells within groundwater protection areas requiring additional review prior to issuance of an approval.*
- *The proposed criteria would specify that if Pumping Capacity (gpm) ÷ Separation Distance (feet) ≥ 0.3 then the proposed well needs additional review and a more thorough assessment of potential impacts. This may include analysis of local geologic/hydrogeologic conditions as well as collection of site-specific information, potentially including pumping tests and stream flow measurements.*

The specific numerical criteria were derived from analysis of protected surface water impacts caused by wells of varying capacity and distance. The worst case scenario evaluated drawdown resulting from a large irrigation well in the sand plains area operating 24 hours per day at a rate of 1,200 gpm for 120 consecutive days. Operation of such a well would result in less than 1' of groundwater drawdown at a point 4,000' from the well and simulation of the same well operating only 12 hours per day would yield a drawdown of less than 6 inches at the same point. Thus, 4,000 feet was determined to be a reasonable distance for designating a GPA in that it is likely that most high capacity wells located greater than 4,000 feet from a protected water will not individually result in significant impacts to the surface water.

Expansion of the GPA to 4,000 feet would likely be an increase in the number of wells proposed within GPAs. Not all high capacity wells sited within 4,000 feet of a protected water body present the same potential for impact and therefore do not warrant the same level of review. In addition to geologic conditions, the potential for impact is driven mainly by the pumping rate and the separation distance between the well and surface

water. Wells with large pumping capacity generally have the potential to result in impacts to surface waters at greater distances. The pumping capacity/separation distance ratio was selected as an appropriate screening criteria because it should be relatively easy to understand and also uses 2 factors in well siting and operation for which the owner has greater control. The specific numerical value of 0.3 was derived based on review of impacts from wells of varying sizes and distances from surface water bodies. In most scenarios evaluated, the resulting drawdown from wells with ratios less than 0.3 would be within the range of 0.5 – 1.0 feet.

In terms of how this alternative would be applied, applicants for high capacity well approvals would understand that there is presumption that siting wells within 4000' of a protected water should be avoided. However, if a well must be sited within that area, the applicant has some assurance of getting the well approved by applying the pumping capacity/separation distance ratio criteria. The applicant has flexibility to select a pumping capacity and separation distance such that no additional review, beyond the normal well construction review, will be necessary. The concept is fairly simple - the more water you want to use, the farther away you need to be; but you can choose to use less and stay closer.

In those situations where the applicant does not have the flexibility to site a well that falls below the 0.3 ratio trigger, the proposed well must undergo more extensive review prior to approval. This review could include assessment of local geologic conditions including the presence of effective aquitards, evaluation of site-specific projected drawdown and depletion of the surface water resources. In addition, site specific evaluation including pumping tests, stream flow measurements and groundwater modeling may also be needed in certain cases.

This alternative represents a scientific, yet practical regulatory approach. Application of the screening criteria gives the applicants some flexibility in siting their wells and will enable the department to focus its attention on those wells that pose the greatest threat. By retaining a GPA approach based on a specified distance most of the existing law and rule will not require revision. Specifically, the other screening criteria in NR 820 will remain in place, the existing mitigation system will remain but will be expanded and the balancing test for approval of municipal wells also remains in tact.

YES: Ambs(DNR), Dantoin(AG), Habush Sinykin(ENV), Graham(ENV), McCartney(IND) - (5)

NO: Carter(AG), Gross(ENV), Hahn(IND), Holdener(IND), Kobza(MUN), Kuehn(AG), Meyers(WD), Nauta(MUN) - (8)

ABSTAIN: Duchniak(MUN) - (1)

2.2.4 GPA Proposal on Expanded Scope of Waters (Committee Vote: Yes (5); No (9))

The following proposal is based on the concept that the scope of waters included under the definition of groundwater protection areas is too limited and that it ignores many other important and valuable surface water features. This proposal recommends that the scope of waters included within groundwater protection areas be expanded to include other valuable surface waters.

DISCUSSION

Presently, Groundwater Protection Areas or "GPAs" are defined by a specified distance from a designated water body. Under current groundwater law, the only water bodies designated for protection from high capacity well groundwater withdrawals are the following: Outstanding Resource Waters (ORWs), Exceptional Resource Waters (ERWs) and trout streams.

Unfortunately, this limited designation of protected waters does not encompass the vast majority of Wisconsin's water resources, leaving unprotected a spectrum of valuable water resources, including the majority of the state's lakes and warm water fisheries. In demonstration of the limited reach of the GPA

designated water inventory, only 97 lakes (out of more than 15,000) fit under the designation of ORWs. There are no ERW lakes in Wisconsin. This means that 99% of Wisconsin's lakes are not covered under Wisconsin's current groundwater law. Without an expansion of the scope of "designated waters" under statutory law, there is certain to be growing numbers of lakes associations seeking protection from adverse groundwater impacts through litigation. As such, case law, not statutory law, will determine the direction of Wisconsin policy in this important regard.

Moreover, whereas most of the ORWs and ERWs are located in the least developed areas of the state, there remain other categories of waters in the more populated areas of the state, such as southeastern Wisconsin, which provide important environmental and economic value to Wisconsin citizens. Many of these waters have received significant expenditures of state and federal funds in the preceding decades to address water quality concerns. It seems discordant to provide legal protection for water quality impacts, but not water quantity impacts, especially given that many of these non-ERW/ORW waters are already in a vulnerable condition.

As set forth below, a solution to these identified gaps under the current law is for Wisconsin to include additional resources under the protected waters designation for Groundwater Protection Areas (GPAs). Another, more comprehensive, solution to these identified gaps would be for Wisconsin to implement a statewide regulatory program for high-capacity wells which provides for an environmental review process that evaluates and aims to mitigate withdrawal impacts to hydraulically connected surface water resources.

PROPOSED RECOMMENDATION
Designation of Groundwater Protection Areas (GPAs) should not be restricted to Exceptional Resource Waters, Outstanding Resource Waters and Trout Streams only. Additional valued water resources, including seepage lakes, rivers, and wetlands that are not trout water or ORWs or ERWs should be considered for GPA designation by the legislature.

YES: Dantoin(AG), Habush Sinykin(ENV), Gross(ENV), McCartney(IND), Nauta(MUN) - (5)

NO: Ambs(DNR), Carter(AG), Duchniak(MUN), Graham(ENV), Hahn(IND), Holdener(IND), Kobza(MUN), Kuehn(AG), Meyers(WD) - (9)

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Chapter 3: Springs

In addition to protecting valuable surface waters, Act 310 also includes provisions to protect springs from impacts of high capacity wells. Springs are areas of groundwater discharge and often contribute to the headwaters of trout streams and other valuable surface waters, contain unique vegetation, and support rare and valuable habitat. Since springs rely on consistent groundwater flow, they could be vulnerable to impacts from excessive groundwater pumping. Thus Act 310 sought to protect springs from such impacts.

Act 310 (s. 281.34(1)1f), Stats.) defined spring as:

> "Spring" means an area of concentrated groundwater discharge occurring at the surface of the land that results in flow of at least one cubic foot per second at least 80% of the time.

Under this definition and the subsequent provisions of Act 310, springs that flow at less than 1 cubic foot per second (cfs) or that flow at that rate less than 80% of the time are not considered to be a spring for purposes of protection under s. 281.34, Stats. or Chapter NR 820.

The protections afforded springs under Act 310 are applied using a different framework than that applicable to surface waters. Rather than specifying a certain distance from a spring, as is the case for groundwater protection areas, the statute applies a standard that is based on the potential for impacts and the need to prevent such impacts. The statute, s. 281.34(5)(d), Stats., and Chapter NR 820, Wis. Adm. Code, each provide that a proposed high capacity well may not be approved if it is determined that the proposed well may result in significant environmental impact.

The legislature directed the Committee to consider the existing definition of spring and include any recommendation regarding that definition in its 2007 report to the legislature.

3.1 Distribution of Springs

When Act 310 was developed, there was a lack of reliable information concerning the number, characteristics and distribution of springs throughout the state. Shortly after passage of the law, a number of research projects were initiated in an effort to compile available data related to springs and also to develop new information concerning springs in certain parts of the state. The Groundwater Coordinating Council funded studies of springs in Calumet, Brown, St. Croix, Iowa and Waukesha Counties, while the Joyce Foundation, in cooperation with the Wisconsin Wildlife Federation, funded a statewide compilation of all available recent and historic springs information, creating a comprehensive springs database.

The database identified a total of 10,851 springs (Figure 4), both current and historic, in the state and of this total, 235 springs were reported to have flow of at least 1 cfs (Figure 5). (Macholl, 2007) According to Macholl (2007), the highest concentration of springs occurs in the southwest corner of the state and the largest springs, by flow, typically occur in glaciated terrain, predominantly in the northwest part of the state.

3.2 Approval of High Capacity Wells Near Springs

As part of the approval process described in section 2.1.1 above, DNR staff review all proposed high capacity well applications to determine potential for significant environmental impacts to a spring, as defined in the statute and rule. Staff considers the listing of springs information in Macholl (2007) as well as other information to ascertain whether there is a spring within a reasonable distance of the proposed well, typically within 2 miles. In addition to the springs database, staff review topographic maps to determine if a spring is formally indicated on the map or if surface water features indicate the presence of spring. If there is an indication a spring of sufficient flow may exist in the vicinity of the well, staff conduct field visits to verify the location and nature of the potential spring. Finally, if the existence of a spring meeting the legal criteria is verified, DNR will evaluate available geologic/hydrogeologic information and the proposed well construction details and use various analytical methods to make an initial determination whether the well could result in significant environmental impact. If significant impacts are predicted, a more extensive environmental review will be conducted.

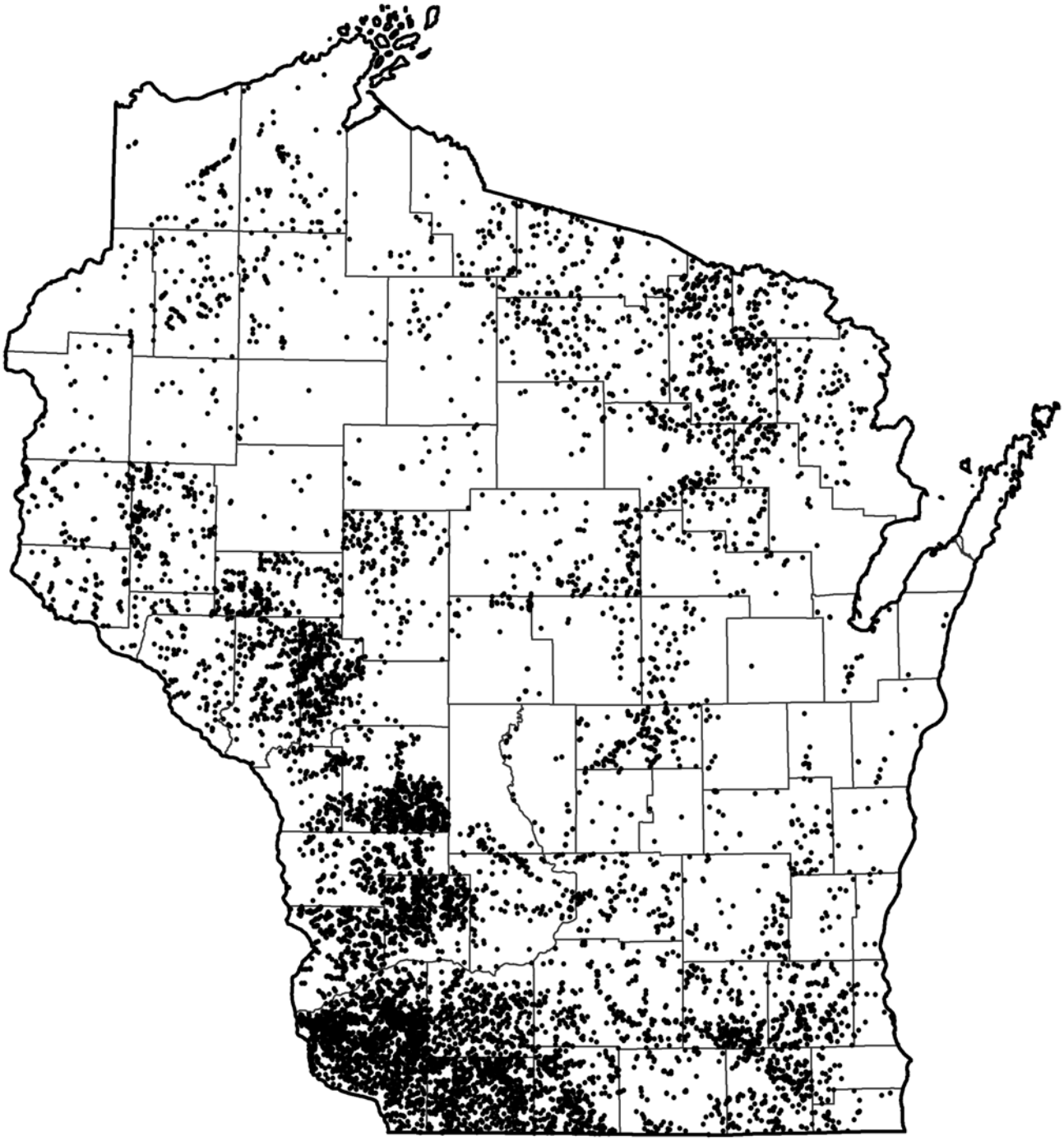

Figure 4. Distribution of all Springs in Wisconsin (Macholl, 2007)

To date, DNR staff has had only a few high capacity well applications involving springs, as defined in Act 310. There have been several instances where an initial review suggested that a spring may be present, but after field verification activities it was determined that the spring did not meet the legal threshold for flow. In the few cases that met the legal criteria, DNR staff reviewed and approved the wells. One well was approved because the aquifer supplying water to the well was separated from the spring by an aquitard, a continuous layer of low permeability material. The aquitard hydrologically separated the spring from the underlying aquifer and thereby limited the chances for impacts as a result of the well. In another instance, DNR staff notified the applicant that additional conditions would be placed on the well construction. The applicant withdrew the application, choosing to use an existing municipal water source. In two ongoing cases, the applicants have been instructed to conduct additional analyses using groundwater models to determine the degree of connectivity between the springs and the proposed well. This information will be used to assess the significance of the potential impacts and whether additional review is necessary.

3.3 Assessment of Effectiveness of Act 310 to Date as Related to Springs

As was the case with groundwater protection areas, an assessment at this time of the effectiveness of Act 310 in protecting springs is limited by the relatively short period of time in which the statute has been fully implemented. Since enactment of the law, only 4 proposed high capacity wells were located within 2 miles of a spring that were within the legal definition. It is possible that the lack of projects involving springs is merely a reflection of the relatively sparse number of springs in the state and their geographic distribution relative to the distribution of high capacity wells in the state. Given the lack of an easily accessible database, it may be difficult for applicants to proactively and consistently locate legally protected springs. No cases of significant impacts to a spring as the result of a high capacity well approved after enactment of Act 310 have been brought to the attention of the DNR or the Committee. Again there are several factors that could contribute to this but there does not appear to be widespread impairment of springs occurring throughout the state as a result of newly approved high capacity wells.

3.4. Issues Related to Definition

Various components of the Act 310 definition of spring were considered by the Committee. Some Committee members and other interested parties have raised concerns with different aspects of the definition including the 1 cfs flow criterion, the 80% flow duration criterion and interpretation of the phrase, “an area of concentrated groundwater discharge occurring at the surface of the land”. Each of these components defines how this portion of the law is implemented.

3.4.1 Flow Rate

When Act 310 was developed, there was a lack of reliable information on the number of springs that would satisfy the 1 cfs flow criteria. It was generally believed that there would be less than 100 springs meeting that criterion. Macholl (2007) documented 235 springs with a flow of at least 1cfs. The majority of springs flow at less than the current statutory threshold of 1 cfs and as such are not directly protected under Act 310. In fulfillment of its charge under Act 310, the Committee considered the appropriateness of the 1cfs threshold and whether an alternative flow criterion should be recommended.

Several Committee members and members of the Geology, Hydrogeology, Hydrology and Public Health Technical Work Group provided information suggesting that the 1cfs flow criterion did not adequately recognize the environmental significance of smaller springs. They pointed out that many springs less than 1 cfs contribute valuable flow to coldwater fisheries and provide habitat for threatened and endangered species and other diverse flora and fauna. Some Committee members believe the definition should include a lower flow criterion. Some of these Committee members proposed an alternative flow threshold of 0.25 cfs, or roughly 110 gallons per minute. According to Macholl (2007), there are 714 springs with historically noted flow of at least 0.25 cfs. An unknown number of additional springs exceeding 0.25 cfs are also likely present within the 28 counties lacking historical springs flow data.

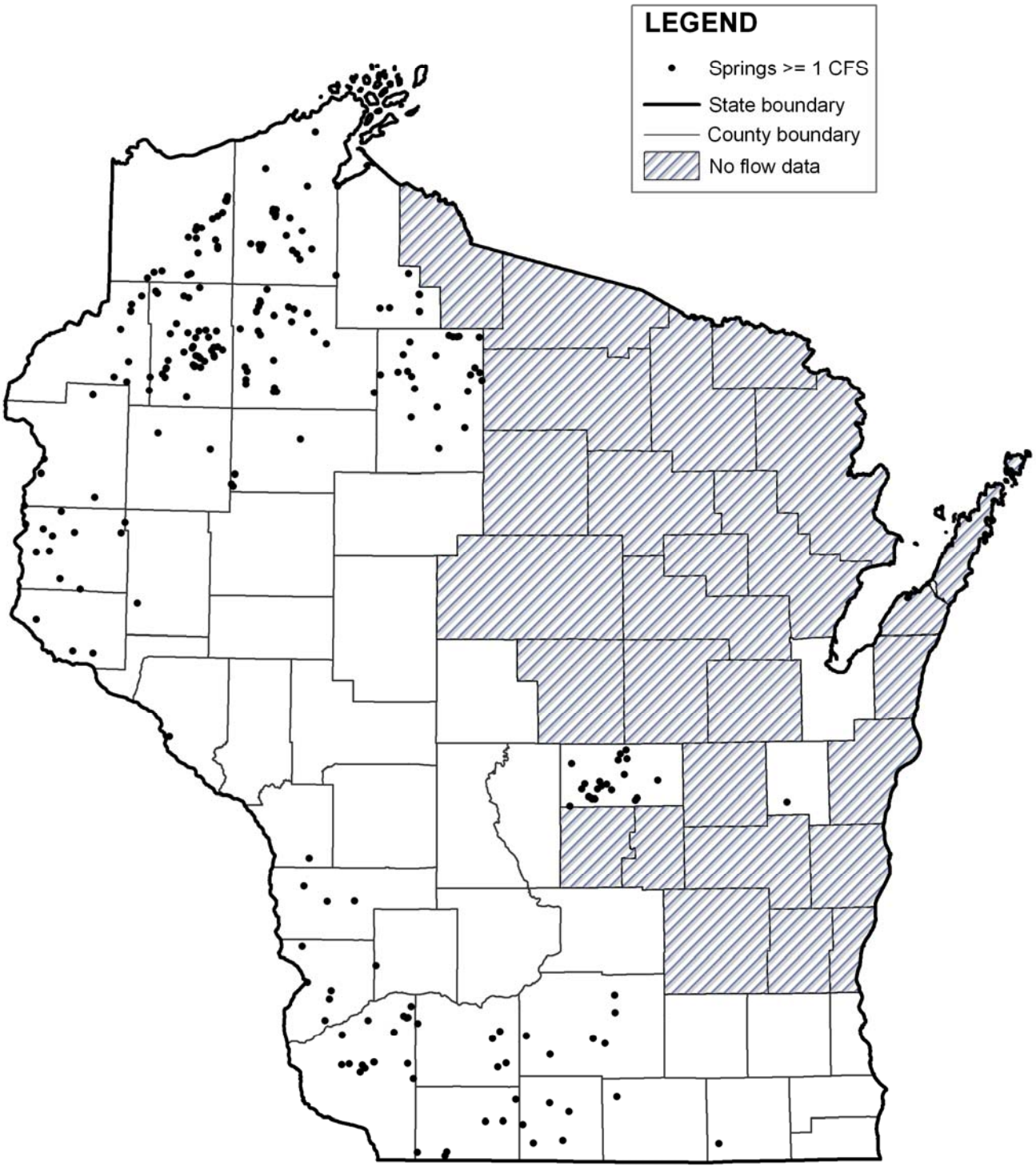

Figure 5. Distribution of 1 cfs Springs (Macholl, 2007)

3.4.2 Flow Frequency

The statutory definition also specifies that for purposes of protection under Act 310, a spring must sustain a flow of at least 1 cfs "at least 80 percent of the time". The overall intent of the flow duration element of the definition was to ensure that springs that only flow at the specified flow rate for limited periods throughout the year should not be considered for purposes of Act 310. Under this definition, in order to be considered a spring, the flow needs to be consistently at or above the flow threshold throughout most of the year. Discussions centered on the difficulty in determining whether a spring flows at a certain flow rate for a specified duration, regardless of the flow rate. It was suggested that inclusion of a flow duration component in the definition is problematic in that it essentially would require extensive monitoring to definitively demonstrate the duration. However, it was also pointed out that a definition based only on a flow criterion could lead to situations in which a single measurement of flow could be used to demonstrate whether a particular spring met the specified flow threshold or not. In such cases, the timing of the flow measurement in the context of seasonal fluctuations could be critical in the determination and ultimately could result in an inaccurate assessment.

3.4.3 Discharge at the Surface of the Land

The third important element in the statutory definition of spring is "…an area of concentrated groundwater discharge occurring at the surface of the land…" This has been interpreted to mean that in order for a spring to satisfy this requirement, it must essentially be a single or discrete point of groundwater discharge visible at the land surface. Under this interpretation, areas of diffuse seepage and small spring ponds with an outlet but no surface inlet would not be considered springs regardless of the resultant flow. As part of the development of Ch. NR 820, some commenters suggested an expanded definition which would include these situations. At that time, the Committee did not endorse the alternative, and did not specifically address this issue during its deliberations in 2007.

3.4.4 Protection Area around Springs

As stated above, the criteria related to protection of springs are applied differently than those applied to protection of surface waters. For applications involving trout streams, outstanding or exceptional resource waters consideration of environmental impacts is triggered by a specified distance between the proposed well and the surface water, 1200 feet. In the case of springs, the legislature adopted a different approach. There is no distance criteria applied to protection of springs. Rather, each well application must be reviewed to determine whether significant environmental impacts could occur. Some Committee members believe this approach is vague and results in uncertainty both for potential well applicants and those who seek environmental protection. They believe that both concerns could be addressed with an approach that does not rely upon a distance standard. (see section 3.5.2)

3.5 Proposals Regarding the Definition of Spring

The Committee was able to reach a near-consensus regarding the need to defer a threshold modification discussion pending an updated springs inventory. Two additional options were formulated by Committee members and discussed by the entire Committee. These, together with the first recommendation, are presented as proposed options to be considered by the legislature.

3.5.1 Springs Proposal on Future Recommendations Based on an Updated Springs Inventory (Committee Vote: Yes (12); No (2))

This proposal is premised on the belief that the extent of field-verified data concerning the distribution and nature of springs throughout the state is not adequate for purposes of recommending changes to existing policy. This proposal recommends that an expanded inventory of springs with a flow of at least 0.25 cfs be completed over the next few years. It also suggests a process by which future recommendations pertaining to protection of springs will be developed and forwarded to the legislature.

DISCUSSION

The GAC believes that additional field-verified data is necessary before considering modification of both the statutory definition of "spring" and the regulatory criteria applied to the protection of springs. Many springs

do not meet or exceed the current 1 cubic foot per second ("cfs") discharge threshold established in the statutes.

The inventories of springs compiled by the Wisconsin Wildlife Federation (WWF) and others represent an important first step in understanding the location and natural resource significance of springs. While the information is extensive, its value for setting policy and regulatory decisions is limited. It is generally agreed that the inventory needs to be updated, verified and expanded before considering modifications to existing policy.

PROPOSED RECOMMENDATION
The Groundwater Advisory Committee recommends the following:

1. *Funding should be made available for a long-term program enabling the DNR to maintain and update a springs database. The data should be made available to the public.*

2. *Two years after funding is in place, the DNR should complete field verification of spring sites with flows of at least 0.25 cfs beginning with information compiled in the Wisconsin Springs Inventory (Wisconsin Wildlife Federation) and in Assessing the Ecological Status and Vulnerability of Springs in Wisconsin (Swanson, S.K., Bradbury, K.R., and Hart, D.J.). Conditions in springs will be partially field-verified through a multi-year project by the DNR. The DNR should explore funding this work through existing Act 310 funds. In the course of completing field work and as resources allow, staff may also field verify springs with a flow rate of less than 0.25 cfs.*

3. *To the extent feasible, the updated springs inventory should note significant environmental/ecological aspects of each spring site visited. If possible, unique environmental settings such as calcareous fens and trout streams along with other important ecological features such as the presence of threatened and endangered species should be noted. The proximity to a Groundwater Protection Area should also be noted.*

4. *Within the first six months following completion of the above mentioned field study, the DNR shall review the updated information. Based on that review, the DNR may recommend changes to the statutory definition of "spring" and develop a list of springs, including a process for publishing, updating, and maintaining the list.*

5. *Within the first six months following completion of the springs field study, the DNR shall form an Advisory Committee to review the results of the field study, and the DNR's proposed recommendations for statutory changes and additional rule-making to protect springs. Based on that review the Committee should advise the Legislature on future policy decisions regarding protection of spring from impacts due to pumping of high capacity wells. The Advisory Committee shall be comprised of representatives similar to that of the Groundwater Advisory Committee established under 2003 Act 310.*

6. *Not more than six months after the Advisory Committee is formed, members will complete a review of the DNR recommendations for statutory modification and rule-making. In advising the DNR, the Committee shall consider the updated information from the springs inventory, and any other available information concerning springs in the state. The Advisory Committee may submit additional recommendations to the legislature concerning the need to statutorily modify the definition of "spring" and other regulatory protection considerations related to springs. Within one month of the Advisory Committee's end date, the DNR and Advisory Committee will submit final recommendations to the Legislature.*

YES: Ambs(DNR), Carter(AG), Dantoin(AG), Duchniak(MUN), Habush Sinykin(ENV), Graham(ENV), Hahn(IND), Holdener(IND), Kobza(MUN), Kuehn(AG), Meyers(WD), McCartney(IND) - (12)

NO: Gross(ENV), Nauta(MUN) - (2)

3.5.2 Springs Proposal to Maintain Existing Definition of Spring and Allow for Both Economic and Environmental Considerations (Committee Vote: Yes (5); No (7); Abstain (2))

This proposal is based on the concept that Act 310 and NR 820 are ambiguous in terms of the level of protection afforded to springs resulting in an undue infringement on property owners to reasonably use the groundwater beneath their land. This proposal recommends that no changes in the existing definition of a spring are needed and that both economic and environmental factors be considered in decisions concerning high capacity wells that may affect springs.

DISCUSSION:
NR 820.29(2) "High Capacity Wells Near Springs" sets the standard for creating a protection zone for 1 cfs springs under the groundwater protection law. The zone of protection is "near" springs, defined as "in the vicinity of…" springs.

The rather ambiguous term "near" is undefined by the Act. NR 820 attempts to define "near" with the phrase "in the vicinity of" (Sec. NR 820.31(1)). This ambiguity creates a disparity of opinion as to what "near" or "in the vicinity of" means. Some believe that it should mean the standard established for other GPA waters, which is 1,200 feet. Others believe that the radius of protection provided by the "near" standard should extend for miles around a spring. This ambiguity creates regulatory and citizen uncertainty that is unacceptable.

The citizen landowners of this state (both private and municipal) have legal rights to groundwater that generally do not extend to surface waters under Wisconsin law. Some of those rights were abdicated to the State by the passage of Act 310 in 2003.

Prior to the passage of that Act, citizens had the right to withdraw groundwater subject to very limited exceptions. The new law greatly expanded those exceptions.

This Committee is charged with the duty of determining whether Act 310 is or is not working. We believe it is working – no wells have been approved by the Wisconsin DNR since the adoption of this Act which have been illustrated to have resulted in any significant harm to any surface water (GPA protected water) or a spring, as defined by the law.

Nonetheless, there are those who insist that the protection of springs be extended to springs smaller than 1 cfs despite the protections that have been provided and despite the existing ambiguity of what constitutes the concept of spring protection. By expanding such protections, and retaining this exceptionally ambiguous phrase, great swaths of land within the state of Wisconsin might, as a result, have imposed new limitations on their owners' ability to withdraw groundwater for either municipal, industrial, or agricultural use. No such expansion of the definition of spring can or should even be considered until such time as the ambiguity of the protective zone "near" or "in the vicinity of" springs is resolved.

We believe that a balancing of our citizen landowners' rights to groundwater with the perceived need to reduce those rights in the name of protecting additional springs using an exceptionally ambiguous term must be approached very cautiously.

PROPOSED RECOMMENDATION:
We therefore propose the following as a "balanced" solution to the reduction of these water rights.

We offer for consideration the following amendment to the law, which would strike the current concept of protecting "near" springs, and replace it with an approach that balances our citizens' rights to groundwater with environmental protection needs.

> *High capacity well applicants have the right to construct and operate wells on their property. However, in this application process, both the high capacity well water needs of the applicant and the potential for impact of withdrawal of that well water on an adjacent spring will be*

considered by the Wisconsin DNR in determining the reasonable location and depth of such well at a site on the applicant's property in a manner that allows the applicant the opportunity to secure the necessary water necessary for the applicant's needs at a reasonable cost.

YES: Carter(AG), Hahn(IND), Holdener(IND), Kuehn(AG), Meyers(WD) - (5)

NO: Ambs(DNR), Dantoin(AG), Habush Sinykin(ENV), Graham(ENV), Gross(ENV), McCartney(IND), Nauta(MUN) - (7)

ABSTAIN: Duchniak(MUN), Kobza(MUN) - (2)

3.5.3 Springs Proposal to Modify Existing Definition - Reduce the Flow Criteria and Eliminate the Flow Duration Requirement (Committee Vote: Yes (5); No (9))

The proposal below suggests that adequate information is presently available to support changes in the statutory definition of spring. This proposal recommends that the flow threshold be reduced to 0.25 cfs and that the flow duration part of the definition be eliminated. It also includes a proposed process for determining the current flow of a spring, suggests a geologic/hydrogeologic evaluation process and recommends that an updated and expanded springs inventory be completed and made available to the public.

DISCUSSION:
Following discussions with Wisconsin hydrogeologists as well as presentations to the GAC and a review of available data on springs in Wisconsin, we have concluded that both the definition of spring and the criteria applied to the protection of a spring need modification.

As the "Springs" subcommittee has shown in presentations this year, many springs have both aesthetic and ecological value, but do not meet or exceed the current 1 cubic foot per second ("cfs") discharge threshold. As indicated by the Wisconsin Wildlife Federation (Inventory of Wisconsin Springs, August 2007), "Springs are valuable features of many ecosystems, supplying water for many diverse habitats including streams, fen-meadows and wetlands. These spring habitats often harbor endangered and threatened species…Springs provide the necessary habitat of cool, oxygen-rich water essential for trout survival."

Data are also available to indicate that development, particularly high capacity pumping, has had an adverse impact on spring-fed water features. As the WWF report indicates, "Spring-fed streams such as the Little Plover River and Bloody Run Creek in central Wisconsin occasionally go dry and have had flow regimes greatly reduced."

The subcommittee and its technical advisory group have also shown that the area in which groundwater flows to a spring can be complex and governed by local geology, and that a pre-determined area of protection based solely on distance is not scientifically valid.

Many, if not most, trout streams are fed by springs, very few of which approach the 1 cfs threshold. Because trout streams were determined in 2003 Act 310 to be worthy of special protection, it seems to us to be illogical to omit springs from comparable, if not greater, protection.

PROPOSED RECOMMENDATION:
Therefore, it is our recommendation that the Legislature direct to DNR to revise Wisconsin Administrative Code ch. NR 820 as follows:

- *Definition of spring: Any natural groundwater discharge at the ground surface of 0.25 cfs or more, with no reference to a Q80 evaluation.*
- *For permit review, use the discharge based on the most recent historical measurement or estimate available.*
- *If the historical measurement is disputed:*

A. If a single new measurement of flow is less than 0.125 cfs (or 50% of the threshold above), then the spring does not meet the test.

B. OR, use an arithmetic average of at least 6 flow measurements collected over a period of 1 year with an average measurement interval greater than 30 days.

- *DNR may apply more rigorous criteria if the discharge is less than the flow threshold but the spring has significant other ecological, biological, or historical significance.*

Radius of concern: The applicant must approximate the capture zone of the spring, based on available information, and include a map showing the estimated capture zone and the proposed well location, in the well approval application. Rationale for the estimation of the capture zone is to be provided, as well. If the WDNR does not concur with the estimated capture zone, the applicant has the option of conducting additional studies.

The proposed well would then be evaluated in consideration of the NR 820 definition of significant adverse environmental impacts, utilizing standard hydrogeologic/biologic analyses. In the event that an applicant does not concur with the DNR's conclusions (and resulting restrictions), the applicant has the option of conducting additional site-specific evaluations, and negotiate a more favorable approval.

Furthermore, we recommend the following:

1. *Funding be provided for a long-term program to maintain and update a springs database. This data base should be made available to the public.*
2. *Initially, all spring sites compiled in the Wisconsin Springs Inventory (Wisconsin Wildlife Federation) and in Assessing the Ecological Status and Vulnerability of Springs in Wisconsin (Swanson, S.K., Bradbury, K.R., and Hart, D.J.) will be included in the spring category. This database should be updated in a 2-year project by the DNR. Limited Term Employees ("LTEs") will be utilized to field-verify flow rates of springs to which the WWF did not have or was not granted access. Funding for this work is available through the existing Groundwater Management Area fund, which has not yet been utilized.*
3. *The LTEs will also be instructed to note the environments associated with the individual springs (e.g., trout streams, wetland, etc.).*

YES: Dantoin(AG), Habush Sinykin(ENV), Gross(ENV), McCartney(IND), Nauta(MUN) - (5)

NO: Ambs(DNR), Carter(AG), Duchniak(MUN), Graham(ENV), Hahn(IND), Holdener(IND), Kobza(MUN), Kuehn(AG), Meyers(WD) - (9)

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Chapter 4: Projects with High Water Loss

4.1 Background and Discussion

Act 310 requires that high capacity wells with a water loss of more than 95% undergo additional review to determine the significance of any resultant impacts. The statute defines water loss as a loss of water from the basin in which it was withdrawn, due either to interbasin diversion or consumptive use of the water. In the context of the existing statutes, basin and interbasin diversion refer to the three major surface water basins in the state, the Lake Michigan, Lake Superior and Mississippi River Basins and consumptive use refers to losses of water due to evaporation and incorporation into a product or agricultural crop. If greater than 95% of the water withdrawn from a high capacity well will either be consumed or diverted from one major basin to another, that well will be subjected to additional review. In implementing this provision, the DNR adopted Chapter NR 820 to require preparation of an environmental assessment for any high capacity well involving a 95% water loss. In addition to Ch. NR 820, water loss and interbasin transfers are also addressed in Ch. NR 142. This code includes provisions related to registration of water withdrawals, procedures to determine consumptive use and water loss, procedures for approval of withdrawals exceeding 2 million gallons per day and specific requirements related to withdrawals and transfers involving the Great Lakes basins.

Most high capacity wells will not approach a water loss of 95% due to consumptive uses. At the time Act 310 was being developed, it was generally thought that wells for water bottling facilities, energy plants and perhaps ethanol plants would be types of wells that might trigger the 95% water loss specification. Since May 2005, the DNR has received only one application for a high capacity well that involved a water loss of greater than 95%. That application, involving a proposed ethanol facility, was recently received and is still in the review process. In other instances, when DNR staff was unsure whether a proposed well exceeded 95% water loss the applicants were required to submit additional information documenting anticipated water flows and balances.

4.2 Recommendations for Changes in the Law as it Pertains to High Capacity Wells with Water Loss Exceeding 95 Percent

The Committee considered the effectiveness of the existing regulatory approach applied to high capacity wells with high water loss. The discussion focused on how such wells are viewed in the context of existing rules and statutes as well as considering any potential inconsistencies in regard to ongoing policy discussions concerning the Great Lakes. The Committee concurred that the current level of protection and regulation was appropriate and that no changes are needed at this time.

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Chapter 5: Determination of Significant Adverse Environmental Impact

5.1 Existing Approach under Chapter NR 820

Act 310 adopted the general concept of prevention of significant environmental impact as the standard of approval for high capacity wells within groundwater protection areas, near springs and involving high water loss. In developing administrative rules to implement the statute, the DNR in consultation with the Committee incorporated the similar approach of prevention of significant adverse environmental impact into Ch. NR 820. Chapter NR 820 goes further than the statutes in that it also defines the term "significant adverse environmental impact" as follows:

> *"Significant adverse environmental impact" means alteration of groundwater levels, groundwater discharge, surface water levels, surface water discharge, groundwater temperature, surface water temperature, groundwater chemistry, surface water chemistry, or other factors to the extent such alterations cause significant degradation of environmental quality including biological and ecological aspects of the affected water resource. (s. NR 820.12(19), Wis. Adm. Code)*

While this definition does not explicitly quantify significance of adverse environmental impacts, it does provide structure to the determination by elucidating factors which may be considered when assessing the relative significance of environmental impacts.

5.2 Recommendations Regarding Significant Environmental Impact

DNR staff provided information to the Committee indicating that terms such as "significant adverse environmental impact", "significant environmental impact" and "significant impact" are commonly used in environmental laws and rules. They are rarely, if ever defined in precise terms. This is true in Wisconsin and other states, as well. While they are subjective in nature, they also adequately convey a sense of priority and provide direction to the regulatory agency in terms of how impacts or other action should be evaluated. They further reflect the recognition that many permissible activities result in some degree of impact and that there can be a balance between allowing those activities and minimizing the severity of the resultant impacts. While determinations as to what constitutes an acceptable level of impact will involve some exercise of professional judgment, they are also normally documented and supported with accepted scientific methods and tools.

Definition of "significant adverse environmental impact" in absolute terms that would be reasonable and appropriate in all instances is not feasible. As is provided in Ch. NR 820, significance of environmental impacts can only effectively be determined on a case-by-case basis, taking into account the unique conditions of each situation.

The Committee reached the following consensus position regarding the adequacy of the existing definition "significant adverse environmental impact":

> *The definition of significant adverse environmental impact in NR 820 does not need to be revised.*
> *-It includes the factors the department should consider to determine whether a high capacity well causes a significant environmental impact.*
> *-Its scope is adequately protective.*
> *-It is consistent with WEPA (Wisconsin Environmental Policy Act).*
> *-It is consistent with the proposed Great Lakes Compact.*

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Chapter 6: Regulation of High Capacity Wells

6.1 Potential for use of General Permits

Act 310 directed the Committee to consider whether certain aspects of the high capacity well regulatory program would be amenable to regulation through issuance of general permits. Specifically, the discussions at the time Act 310 was developed centered on the approval of high capacity wells for temporary construction site dewatering.

Temporary construction site dewatering wells generally pose less environmental threat than most permanent high capacity wells. These projects are typically short term in nature and involve pumping only from unconsolidated deposits resulting in maximum groundwater drawdown of 10 to 20 feet at the construction.

Temporary construction site dewatering wells, like other high capacity wells, require an approval. They undergo essentially the same locational review process applicable to permanent high capacity wells. Thus, trout streams, exceptional resource waters and outstanding resource waters receive the same protection with these projects as with other permanent high capacity well projects. However, the remainder of the application and approval process for these projects differs significantly from the approval process for other permanent high capacity wells. While each project undergoes a site-specific review, the process is streamlined. Applications are treated as a priority and approvals are issued quickly. In 2006, the average approval was issued in 11.3 calendar days for the 50 projects that were approved. Particular emphasis is placed on identification of potential contamination sites to prevent inadvertent pumping of contaminated groundwater and ultimate discharge of contaminants to surface waters. Essentially all projects will also need a discharge permit from the DNR wastewater program. Finally, if the DNR determines that the base flow of a stream may be impaired from pumping activities, the DNR may specify conditions of approval to maintain the base flow rate in the creek.

A working group of the Committee reviewed the approval process for temporary construction site dewatering projects and was in general agreement with the approach followed by DNR. The Committee, as a whole, did not make any recommendations in regard to use of general permits for approval of construction site dewatering wells.

6.2 Strategies for Adaptive Management in Regulation of High Capacity Wells

Act 310 also directed the Committee to develop recommendations for groundwater management strategies that facilitate adaptive management in the high capacity well regulatory program. The Committee was able to reach near unanimous agreement regarding a proposal recommending regular legislative review of the groundwater quantity statutes. Another proposal suggesting the need for modification of Ch. NR 820 was also developed and considered by the Committee. Both of these proposals are discussed in the following sections.

6.2.1 Proposal on Regular Legislative Review of Groundwater Quantity Statutes (Committee Vote: Yes (11); No (3))

The following proposal provides that the legislature should review the adequacy of the groundwater quantity regulatory framework every five years, taking all available information into consideration as it decides whether changes are warranted.

> *DISCUSSION:*
> *Increased demand for water caused by population and economic growth as well as changing stresses from weather patterns have caused adverse impacts to water resources in areas of Wisconsin such as Waukesha County, Dane County, and the central sand plains. Present indicators suggest stressors will only increase in the future. To prevent the problems we see occurring elsewhere from affecting groundwater protection areas (GPAs), management of the state's water resources must adapt to increased demands. In particular, the Groundwater Quantity Law, Act 310, must have adaptive management as its underpinning to ensure that both our resources and our economic growth can be protected and, where they are in conflict, informed choices can be made. Act 310 has been described as a first step in the protection of groundwater quantity in Wisconsin; subsequent steps are necessary and must be responsive to changing population, economic, and environmental conditions.*

PROPOSED RECOMMENDATION:
Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operating programs. In the case of Act 310, this means the law should be on a regular, five-year review schedule that evaluates the law in light of broad water management goals and state-wide water management policies. Data and evaluation provided by the DNR and the Groundwater Coordinating Council should be used by the Legislature to regularly assess the effectiveness and breadth of the Law and to revise it, if necessary.

YES: Ambs(DNR), Dantoin(AG), Duchniak(MUN), Habush Sinykin(ENV), Graham(ENV), Hahn(IND), Holdener(IND), Kobza(MUN), Kuehn(AG), McCartney(IND), Nauta(MUN) - (11)

NO: Carter(AG), Gross(ENV), Meyer(WD) - (3)

6.2.2 Proposed Changes to Chapter NR 820 (Committee Vote: Yes (5); No (5); Abstain (4))

In addition to the previous proposal, the Committee also considered a proposal to revise the existing regulatory review process in Ch. NR 820 for high capacity wells in groundwater protection areas and near springs. The proposal recommends that applicants should be required to conduct greater site-specific quantitative analysis of the potential impacts from high capacity wells and that data submitted in high capacity well applications should be compiled by the DNR and maintained in a publicly accessible database.

DISCUSSION:
The approval process for high capacity wells must have adaptive management as its underpinning to ensure that both our resources and our economic growth can be protected and, where they are in conflict, informed choices can be made.

Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operating programs. In the case of the process for evaluating the impact of high capacity wells, this means the applicant must provide data about water levels, stream flows, ecological quality, as well as the currently requested basics of pump capacity and well depth. The data and evaluation provided by the applicants should be used by the Department to approve, deny, or revise the application.

This information would also be used to update a database, which applicants could access to find the best locations for high capacity wells and which the DNR could use for the continued management of the resource. Open access by the regulated community and regulators to this information will allow the best decisions to be made with the least delays, encouraging our economy, protecting our resources and facilitating informed choices where resources and economic decisions are in conflict.

PROPOSED RECOMMENDATION:
We recommend that the Legislature direct the DNR to revise NR 820 as follows:

- *To specify a transparent and rational process for the regulated community to follow in determining the environmental impact of a proposed high-capacity well on a GPA or spring.*
- *Applicants should be required to complete the analysis, with DNR oversight, review and independent verification, as necessary;*
- *At a minimum, the application must consider the proposed rate and timing of pumping, cumulative annual extraction, fate of extracted water, ecological impacts (including changes to water chemistry and temperature), what springs or reaches of GPAs might be affected, and the cumulative effects of other groundwater extractors.*
- *The revised rule should require quantitative analyses, beginning with screening by rudimentary hydrogeologic methods that are widely used and generally available and, if necessary, proceeding to more rigorous methods including models with increased levels of sophistication.*

- *DNR should compile a database of input parameters for the quantitative analyses required for the process of determining environmental impact so that default parameters are available for applicants. This database should be readily available to applicants and the public.*
- *The database should be continuously updated from applications as they are received and reviewed so that the approval process can adapt to the accumulation of more site-specific data and, if necessary, to changing hydrogeologic conditions.*

YES: Dantoin(AG), Habush Sinykin(ENV), Gross(ENV), McCartney(IND), Nauta(MUN) - (5)

NO: Duchniak(MUN), Hahn(IND), Kobza(MUN), Kuehn(AG), Meyer(WD) - (5)

ABSTAIN: Ambs(DNR), Carter(AG), Graham(ENV), Holdener(IND) - (4)

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Chapter 7: Funding

In both 2006 and 2007, the Committee identified several issues of immediate need that would improve the ability of the state to implement Act 310 as is currently exists. The 2006 Report to the Legislature recommended enhancement of the statewide groundwater monitoring network and there was general agreement in 2007 that the DNR should initiate a process to update available information concerning springs. Each of these activities could be accomplished using existing funds but would require changes in existing appropriations. The Committee would support efforts by the DNR to reallocate existing appropriations in order to fund needs associated with Act 310 such as enhancement of the monitoring network and updating the springs database.

7.1 Existing Funding Sources

Act 310 instituted two separate fees to generate revenue needed to support the DNR's efforts to implement Act 310 in the state, a $50 well notification fee and a $500 high capacity well approval application fee. When Act 310 was developed, it was estimated that approximately $1,000,000 would be generated each year through the two fees, $850,000 through well notifications and $150,000 through high capacity well applications. In the two years since the fee programs were initiated, the DNR has collected about $1.8 million.

7.2 Existing and Anticipated Expenditures

Act 310 designated how revenues generated through the two fees discussed above are distributed. The revenue is divided between costs of administration (e.g., salaries and related costs), research, aid to local governments and mitigation. Generally, the structure is such that fixed appropriations are established each year to cover the costs associated with program administration and research and the remainder of the revenue, as well as carryover from the previous year, accumulates in a fund designated for assisting local governments and funding necessary mitigation activities.

7.2.1 Administration

Past Expenditures

The DNR received authorization for five full-time permanent positions as part of Act 310 and has subsequently filled all of those positions. DNR staff in these positions are responsible for conducting reviews of proposed high capacity wells for compliance with Ch. NR 820, conducting surveillance activities and developing and maintaining data management systems related to the groundwater quantity program. Annual costs for those positions and other related administrative costs are currently about $387,000.

Future Needs

The current administrative costs related to implementing the groundwater quantity program are expected to continue. It is also anticipated that additional staff will be needed to implement recommendations contained in the 2006 GAC Report to the legislature. The highest existing priority staffing needs relate to grants management activities and data systems management, at an annual cost of approximately $140,000.

7.2.2 Research and Monitoring

Past Expenditures

The DNR has supported limited research activity with funds generated through the fees enacted by Act 310 over the past two years. Several studies related to inventorying springs in various parts of the state were funded and have been completed. Annual allotments have been established at $100,000 each year for research and monitoring purposes and approximately $138,000 has been expended over the last two fiscal years. Additional research should be encouraged through continued funding.

Future Research and Monitoring Needs

The Committee recognizes two future research and monitoring projects as being of high priority. For the first project, the DNR would, as proposed in Section 3.5.1, update the existing information in the Wisconsin Wildlife Federation springs database by conducting extensive field verification activities at all springs with historic flow of at least 0.25 cfs. The DNR has estimated the approximate cost of this 2-year inventory to be approximately $250,000.

For the second project, the DNR would propose to improve the state's comprehensive groundwater monitoring network. The 2006 Groundwater Advisory Committee Report to the Legislature recognized the importance of this program:

> *A comprehensive groundwater monitoring program is an essential component in an effective statewide groundwater management strategy. The existing groundwater monitoring network jointly coordinated by the Wisconsin Geological & Natural History Survey and the U.S. Geological Survey generates valuable information and could serve as a sound foundation but, to be truly effective, the monitoring and data management systems need to be enhanced.*

The Wisconsin Geological & Natural History Survey, U.S. Geological Survey and DNR have identified specific needs and opportunities regarding the monitoring network. Establishing observation wells in specific areas of interest such as the Groundwater Management Areas and areas suggested as Groundwater Attention Areas in addition to filling other identified gaps in the network could require expenditures in excess of $100,000/year over the next six years. Improvement of the groundwater monitoring network is recognized to be of high priority and funding should be made available at the DNR's discretion as opportunities to add to the network arise.

A third research project has also been discussed. At the time Act 310 was developed, it was contemplated that, in addition to the statewide observation well network, additional shallow groundwater monitoring wells in combination with surface water monitoring stations are necessary. Information generated from these sites is needed to assess impacts from high capacity wells on sensitive surface water resources protected under Act 310. In addition, the information generated concerning surface water and groundwater interactions would be useful in establishing "reference flows" for purposes of implementing proposed Ch. NR 820. The fiscal estimate developed for Act 310 projected the costs for developing, operating and maintaining this groundwater/surface water monitoring system to be $477,000. While this element of the monitoring program is important, it is a third priority following the springs inventory and the additions to the statewide groundwater monitoring network.

7.2.3 Local Aid and Mitigation

Act 310 specified that the portion of the revenues not designated for program administration or research/monitoring activities were to be used for groundwater mitigation and local assistance. In accordance with s. 281.34(8)(d), if the DNR orders an owner of a high capacity well that is located within a groundwater protection area to mitigate the impacts of the well, the DNR must provide funding for the full costs of mitigation. Act 310 also directs the DNR to assist local units of government within groundwater management areas by providing funding for research and funding related to groundwater management.

It is difficult to accurately predict the costs associated with mitigation as they would be extremely variable depending on the nature of the well that must be mitigated and the extent of mitigation deemed necessary. Costs could realistically range from several thousand dollars to several million dollars. Given that mitigation of wells within groundwater protection areas ordered by the DNR must be fully funded, there is little likelihood that significant mitigation activities will be ordered.

Significant financial support from the state will be required if local governmental units are expected to effectively collaborate. The fiscal estimate prepared for Act 310 projected aid to local governments within groundwater management areas would cost approximately $1 million per year. These expenditures will not be realized for several years, but once substantive requirements pertaining to groundwater management areas are in place, the demand for local aid and assistance will certainly increase.

The Committee recognizes that increases in appropriations related to administration and research/monitoring to meet high priority needs will result in less money accumulating in the Local Aid/Mitigation appropriation. However, these activities are important in meeting the goals of Act 310. The Committee supports reasonable efforts of the DNR to exercise its discretion to seek increased appropriations related to administration and research/monitoring as high priority needs are identified. Such increases, however, should not reduce the amount of funds available in the local aids/mitigation appropriation to a level that is insufficient to meet the anticipated needs of local governments at such

time that the recommendations in the *2006 Groundwater Advisory Committee Report to the Legislature* are implemented.

7.3 Fiscal Implications of Committee Recommendations and Proposed Options

The recommendations and proposed options contained in this report have varied degrees of funding implications. Some would require substantial increases in DNR resources while others would have minor or no fiscal impact. The Committee did not attempt to quantify these impacts in significant detail. Rather, they are discussed in general terms.

The fiscal impact associated with the recommendation presented in Subsection 1.3.1 (Statewide Water Policy) and the proposed option in Subsection 1.3.2 (Water Conservation) are difficult to assess at this time. The recommendations and proposed options call for broad statewide policy initiatives and efforts to attribute fiscal impacts to these statements would be highly speculative.

Of the proposals presented in Section 2.2 pertaining to groundwater protection areas, the proposed option requiring hydrogeologic analysis of all high capacity well applications (section 2.2.2) would result in the greatest fiscal impact. This is the case because it would require additional DNR resources in order to be implemented. The options described in Sections 2.2.3 (Expanded GPA) and 2.2.4 (Expanded scope of protected waters) would also require additional resources but would be of less significance. The proposed option presented in Section 2.2.1 would have no additional fiscal impact since it maintains the current regulatory structure.

Proposed option 3.5.3, advocating lowering the flow criteria for springs and eliminating the flow duration requirement, would have the greatest fiscal impact of the proposals pertaining to springs. This proposal would require additional DNR review staff to verify conditions of springs and assess potential impacts. Proposed option 3.5.1 (Updated Springs Inventory) would require a short-term and relatively finite expenditure of funds to complete the inventory and could have additional fiscal impacts related to implementation of future policy decisions. Proposed option 3.5.2 would have minor fiscal impacts as it maintains the current springs definition but adds an additional element to the review process that allows for consideration of economic impacts.

Of the two proposed options in Section 6.2, proposed option 6.2.2(Changes to NR 820) would have the greatest fiscal impact. This proposal would require substantial rule-making and would also require additional DNR review staff resources. The direct fiscal impacts associated with proposed option 6.2.1 (Regular Legislative Review of Act 310) are unknown. It is uncertain what level of information would be necessary to support the regular legislative reviews contemplated in the proposal.

If the legislature pursues any of the Committee's recommendations or proposed options as part of future legislation, a detailed fiscal estimate would be prepared at that time.

7.4 Funding Options

As noted above, if implemented, several of the Committee's recommendations and proposed options would require additional resources. More discussion needs to occur if the recommendations or proposed options are acted upon by the legislature. The Committee did not attempt to identify preferred funding options. A brief listing of possible sources is:

- Additional General Purpose Revenue funding
- Statewide Fees – new fees and/or increases in existing fees
- Targeted groundwater management area fees
- Allow for cost-sharing or other mitigation funding alternatives.

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Chapter 8 Closing

2003 Wisconsin Act 310 represents a significant and important initial step in achieving integrated water management in the State. The law provides an added level of environmental protection for trout streams, outstanding resource waters, exceptional resource waters and springs by ensuring that high capacity wells sited in close proximity to these resources are evaluated and attendant impacts reduced as part of the high capacity well approval process. Further work remains to build upon the initial improvements in groundwater management provided under Act 310.

The recommendations and alternatives discussed in this report, along with the recommendations in the Committee's 2006 Report should serve as a solid foundation for future deliberations to modify and enhance the existing regulatory framework. Information and data collected through continued implementation of Act 310 along with results of ongoing research and monitoring activities will also be critical for effective discussions.

The Committee believes that it has satisfied all of the elements of its statutory charge. While the issues addressed by the Committee have been challenging and complex, the Committee was successful in formulating workable solutions to many of them. This collaborative approach between diverse stakeholders should continue.

References

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Appendix A

2003 Wisconsin Act 310

(http://www.legis.state.wi.us/2003/data/acts/03Act310.pdf)

Date of enactment: **April 22, 2004**
2003 Assembly Bill 926 Date of publication*: **May 6, 2004**

2003 WISCONSIN ACT 310

(Vetoed in Part)

AN ACT ***to repeal*** 281.17 (1); ***to amend*** 23.11 (5), 281.35 (1) (a), 281.35 (1) (b) 2., 281.35 (4) (a) 2., 281.35 (4) (b) (intro.), 293.65 (3) and 299.05 (2) (b); and ***to create*** 20.370 (4) (cg), 20.370 (4) (ch), 20.370 (6) (eg), 281.34 and 281.35 (4) (a) 2m. of the statutes; **relating to:** regulation of high capacity wells, notification of well construction, groundwater quantity management, granting rule−making authority, and making appropriations.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. 20.005 (3) (schedule) of the statutes: at the appropriate place, insert the following amounts for the purposes indicated:

				2003−04	**2004−05**
20.370	**Natural resources, department of**				
(4)	WATER				
(cg)	Groundwater quantity administration	PR	A	−0−	−0−
(ch)	Groundwater quantity research	PR	B	−0−	−0−

SECTION 2. 20.370 (4) (cg) of the statutes is created to read:

20.370 **(4)** (cg) *Groundwater quantity administration.* From the general fund, from the moneys received under s. 281.34, the amounts in the schedule for the administration of the program under s. 281.34.

SECTION 3. 20.370 (4) (ch) of the statutes is created to read:

20.370 **(4)** (ch) *Groundwater quantity research.* Biennially, from the general fund, from the moneys received under s. 281.34, the amounts in the schedule for groundwater research and monitoring under s. 281.34 (10).

SECTION 4. 20.370 (6) (eg) of the statutes is created to read:

20.370 **(6)** (eg) *Groundwater mitigation and local assistance.* All moneys received under s. 281.34 not appropriated under sub. (4) (cg) or (ch) for mitigation under s. 281.34 (8) (d) and (9) (d) and funding to local governmental units under s. 281.34 (9) (b).

SECTION 5. 23.11 (5) of the statutes is amended to read:

23.11 **(5)** The department may require an applicant for a permit or statutory approval which the department, by order, may grant, to submit an environmental impact report if the area affected exceeds 40 acres ~~or,~~ the esti-

* Section 991.11, WISCONSIN STATUTES 2001−02 : Effective date of acts. "Every act and every portion of an act enacted by the legislature over the governor's partial veto which does not expressly prescribe the time when it takes effect shall take effect on the day after its date of publication as designated" by the secretary of state [the date of publication may not be more than 10 working days after the date of enactment].

mated cost of the project exceeds $25,000, or the applicant is requesting approval for a high capacity well described in s. 281.34 (4) (a) 1. to 3.

SECTION 6. 281.17 (1) of the statutes is repealed.

SECTION 7. 281.34 of the statutes is created to read:

281.34 Groundwater withdrawals. (1) DEFINITIONS. In this section:

(a) "Groundwater protection area" means an area within 1,200 feet of any of the following:

1. An outstanding resource water identified under s. 281.15 that is not a trout stream.

2. An exceptional resource water identified under s. 281.15 that is not a trout stream.

3. A class I, class II, or class III trout stream, other than a class I, class II, or class III trout stream that is a farm drainage ditch with no prior stream history, as identified under sub. (8) (a).

(b) "High capacity well" means a well that, together with all other wells on the same property, has a capacity and rate of withdrawal of more than 100,000 gallons per day. **Vetoed In Part**

(c) "Local governmental unit" means a city, village, town, county, town sanitary district, utility district under s. 66.0827 that provides water, public inland lake protection and rehabilitation district that has town sanitary district powers under s. 33.22 (3), joint local water authority created under s. 66.0823, or municipal water district under s. 198.22.

(d) "Owner" means a person who owns property on which a well is located or proposed to be located or the designated representative of such a person.

(e) "Potentiometric surface" means a measure of pressure of groundwater in an aquifer based on the level to which groundwater will rise in a well placed in the aquifer.

(f) "Spring" means an area of concentrated groundwater discharge occurring at the surface of the land that results in a flow of at least one cubic foot per second at least 80 percent of the time.

(g) "Water loss" means a loss of water from the basin from which it is withdrawn as a result of interbasin diversion or consumptive use or both.

(h) "Well" means any drillhole or other excavation or opening deeper than it is wide that extends more than 10 feet below the ground surface and is constructed for the purpose of obtaining groundwater.

(2) APPROVAL REQUIRED FOR HIGH CAPACITY WELLS. An owner shall apply to the department for approval before construction of a high capacity well begins. No person may construct or withdraw water from a high capacity well without the approval of the department under this section or under s. 281.17 (1), 2001 stats. An owner applying for approval under this subsection shall pay a fee of $500.

(2m) TEMPORARY DEWATERING WELLS. The department shall issue a single approval under sub. (2) for all high capacity wells constructed for one project, as determined by the department, for temporary dewatering of a construction site, including a construction site for a building, road, or utility. The department shall provide for amendments to a project under this subsection. A person applying for approval of high capacity wells for a project under this subsection is only required to pay one $500 fee.

(3) NOTIFICATION REQUIRED FOR OTHER WELLS. An owner shall notify the department of the location of a well that is not a high capacity well before construction of the well begins. An owner notifying the department under this subsection shall pay a fee of $50.

(4) ENVIRONMENTAL REVIEW. (a) The department shall review an application for approval of any of the following using the environmental review process in its rules promulgated under s. 1.11 applicable to an action that normally does not have the potential to cause significant environmental effects, normally does not significantly affect energy usage, and normally does not involve unresolved conflicts in the use of available resources: **Vetoed In Part**

1. A high capacity well that is located in a groundwater protection area.

2. A high capacity well with a water loss of more than 95 percent of the amount of water withdrawn.

3. A high capacity well that may have a significant environmental impact on a spring.

(b) If, under sub. (5) (b), (c), or (d), the department requests an environmental impact report under s. 23.11 (5) for a proposed high capacity well, the department may only request information in that report that relates to the decisions that the department makes under this section related to the proposed high capacity well.

(5) STANDARDS AND CONDITIONS FOR APPROVAL. (a) *Public water supply.* If the department determines that a proposed high capacity well may impair the water supply of a public utility engaged in furnishing water to or for the public, the department may not approve the high capacity well unless it is able to include and includes in the approval conditions, which may include conditions as to location, depth, pumping capacity, rate of flow, and ultimate use, that will ensure that the water supply of the public utility will not be impaired.

(b) *Groundwater protection area.* 1. Except as provided in subd. 2., if the department determines, under the environmental review process in sub. (4), that an environmental impact report under s. 23.11 (5) must be prepared for a proposed high capacity well located in a groundwater protection area, the department may not approve the high capacity well unless it is able to include and includes in the approval conditions, which may include conditions as to location, depth, pumping capacity, rate of flow, and ultimate use, that ensure that the high

capacity well does not cause significant environmental impact.

2. Subdivision 1. does not apply to a proposed high capacity well that is located in a groundwater protection area and that is a water supply for a public utility engaged in supplying water to or for the public, if the department determines that there is no other reasonable alternative location for a well and is able to include and includes in the approval conditions, which may include conditions as to location, depth, pumping capacity, rate of flow, and ultimate use, that ensure that the environmental impact of the well is balanced by the public benefit of the well related to public health and safety.

(c) *High water loss.* If the department determines, under the environmental review process in sub. (4), that an environmental impact report under s. 23.11 (5) must be prepared for a proposed high capacity well with a water loss of more than 95 percent of the amount of water withdrawn, the department may not approve the high capacity well unless it is able to include and includes in the approval conditions, which may include conditions as to location, depth, pumping capacity, rate of flow, and ultimate use, that ensure that the high capacity well does not cause significant environmental impact.

(d) *Impact on a spring.* 1. Except as provided in subd. 2., if the department determines, under the environmental review process in sub. (4), that an environmental impact report under s. 23.11 (5) must be prepared for a proposed high capacity well that may have a significant environmental impact on a spring, the department may not approve the high capacity well unless it is able to include and includes in the approval conditions, which may include conditions as to location, depth, pumping capacity, rate of flow, and ultimate use, that ensure that the high capacity well does not cause significant environmental impact.

2. Subdivision 1. does not apply to a proposed high capacity well that may have a significant environmental impact on a spring and that is a water supply for a public utility engaged in supplying water to or for the public, if the department determines that there is no other reasonable alternative location for a well and is able to include and includes in the approval conditions, which may include conditions as to location, depth, pumping capacity, rate of flow, and ultimate use, that ensure that the environmental impact of the well is balanced by the public benefit of the well related to public health and safety.

(e) *All high capacity wells.* 1. If s. 281.35 applies to a proposed high capacity well, the department shall include in the approval conditions that ensure that the high capacity well complies with s. 281.35.

2. The department shall include in the approval for each high capacity well requirements that the owner identify the location of the high capacity well and submit an annual pumping report.

(6) PREEXISTING HIGH CAPACITY WELLS. (a) The owner of a high capacity well for which the department issued an approval under s. 281.17 (1), 2001 stats., shall provide to the department information concerning the location of the well and an annual pumping report.

(b) The department shall promulgate rules specifying the date and method by which owners of high capacity wells shall comply with par. (a).

(7) MODIFYING AND RESCINDING APPROVALS FOR HIGH CAPACITY WELLS. The approval of a high capacity well issued under this section or under s. 281.17 (1), 2001 stats., remains in effect unless the department modifies or rescinds the approval because the high capacity well or the use of the high capacity well is not in conformance with standards or conditions applicable to the approval of the high capacity well.

(8) GROUNDWATER PROTECTION AREAS. (a) The department shall promulgate rules identifying class I, class II, and class III trout streams for the purposes of this section. The department shall identify as a class I trout stream a stream or portion of a stream with a self–sustaining population of trout. The department shall identify as a class II trout stream a stream or portion of a stream that contains a population of trout made up of one or more age groups, above the age one year, in sufficient numbers to indicate substantial survival from one year to the next but in which stocking is necessary to fully utilize the available trout habitat or to sustain the fishery. The department shall identify as a class III trout stream a stream or portion of a stream that has marginal trout habitat with no natural reproduction of trout occurring, requiring annual stocking of trout to provide trout fishing, and generally without carryover of trout from one year to the next. In the rules under this paragraph, the department shall identify any class I, class II, or class III trout stream that is a farm drainage ditch with no prior stream history.

(b) The department shall create accurate images of groundwater protection areas.

(c) A person who proposes to construct a high capacity well may request the department to determine whether the proposed location of the high capacity well is within a groundwater protection area.

(d) The department shall administer a program to mitigate the effects of wells constructed before the effective date of this paragraph .... [revisor inserts date], that are located in groundwater protection areas. Mitigation may include abandonment of wells and replacement of wells, if necessary, and management strategies. Under the mitigation program, the department may order the owner of a well constructed before the effective date of this paragraph .... [revisor inserts date], that is located in a groundwater protection area to undertake mitigation but only if the department provides funding for the full cost of the mitigation, except that full funding is not required if the department is authorized under ch. 280 to

require the well to be abandoned because of issues regarding public health.

(9) GROUNDWATER MANAGEMENT AREAS. (a) The department shall, by rule, designate 2 groundwater management areas including and surrounding Brown County and Waukesha County consisting of the entire area of each city, village, and town at least a portion of which is within the area in which, on the effective date of this paragraph .... [revisor inserts date], the groundwater potentiometric surface has been reduced 150 feet or more from the level at which the potentiometric surface would be if no groundwater had been pumped.

(b) The department shall assist local governmental units and regional planning commissions in groundwater management areas designated under par. (a) by providing advice, incentives, and funding for research and planning related to groundwater management.

(c) If the groundwater advisory committee created under 2003 Wisconsin Act .... (this act), section 15 (2) (b) does not issue the report under 2003 Wisconsin Act .... (this act), section 15 (2) (e) by January 1, 2007, the department shall promulgate rules using its authority under ss. 281.12 (1) and 281.35 to address the management of groundwater in groundwater management areas.

(d) If the department promulgates rules under par. (c) and the rules require mitigation in the same or a similar manner as under sub. (8) (d), the department may not require mitigation for a well under the rules unless the department provides funding for the full cost of the mitigation, except that full funding is not required if the department is authorized under ch. 280 to require the well to be abandoned because of issues regarding public health.

(10) RESEARCH AND MONITORING. To aid in the administration of this section the department shall, with the advice of the groundwater coordinating council, conduct monitoring and research related to all of the following:

(a) Interaction of groundwater and surface water.

(b) Characterization of groundwater resources.

(c) Strategies for managing water.

SECTION 8. 281.35 (1) (a) of the statutes is amended to read:

281.35 **(1)** (a) "Approval" means a permit issued under s. 30.18 or an approval under s. 281.17 (1), 2001 stats., or s. 281.34 or 281.41.

SECTION 9. 281.35 (1) (b) 2. of the statutes is amended to read:

281.35 **(1)** (b) 2. If subd. 1. does not apply, the highest average daily water loss over any 30−day period that is reported to the department or the public service commission under sub. (3) (c) or s. 30.18 (6) (c), 196.98, ~~281.17 (1)~~ 281.34, or 281.41 or s. 281.17 (1), 2001 stats.

SECTION 10. 281.35 (4) (a) 2. of the statutes is amended to read:

281.35 **(4)** (a) 2. A person who is operating a well under an approval issued under s. 281.17 (1) ~~or who is required to obtain an approval under that paragraph before constructing or installing a well~~, 2001 stats.

SECTION 11. 281.35 (4) (a) 2m. of the statutes is created to read:

281.35 **(4)** (a) 2m. A person who is operating a well under an approval issued under s. 281.34 or who is required to obtain an approval under that section before constructing a well.

SECTION 12. 281.35 (4) (b) (intro.) of the statutes is amended to read:

281.35 **(4)** (b) (intro.) Before any person specified in par. (a) may begin a new withdrawal or increase the amount of an existing withdrawal, the person shall apply to the department under s. 30.18, ~~281.17 (1)~~ 281.34, or 281.41 for a new approval or a modification of its existing approval if either of the following conditions applies:

SECTION 13. 293.65 (3) of the statutes is amended to read:

293.65 **(3)** WITHDRAWAL OF GROUNDWATER; DEWATERING; PERMIT REQUIREMENTS. (a) An approval under s. ~~281.17 (1)~~ 281.34 is required to withdraw groundwater or to dewater mines if the capacity and rate of withdrawal of all wells involved in the withdrawal of groundwater or the dewatering of mines exceeds 100,000 gallons each day. A permit under s. 283.31 is required to discharge pollutants resulting from the dewatering of mines.

(b) The department may not issue an approval under s. ~~281.17 (1)~~ 281.34 if the withdrawal of groundwater for prospecting or mining purposes or the dewatering of mines will result in the unreasonable detriment of public or private water supplies or the unreasonable detriment of public rights in the waters of the state. No withdrawal of groundwater or dewatering of mines may be made to the unreasonable detriment of public or private water supplies or the unreasonable detriment of public rights in the waters of the state.

SECTION 14. 299.05 (2) (b) of the statutes is amended to read:

299.05 **(2)** (b) Approvals under s. ~~281.17 (1)~~ 281.34.

SECTION 15. Nonstatutory provisions.

(2) GROUNDWATER ADVISORY COMMITTEE.

(a) In this subsection:

1. "Groundwater protection area" has the meaning given in section 281.34 (1) (a) of the statutes, as created by this act.

2. "High capacity well" has the meaning given in section 281.34 (1) (b) of the statutes, as created by this act.

3. "Local governmental unit" has the meaning given in section 281.34 (1) (c) of the statutes, as created by this act.

4. "Spring" has the meaning given in section 281.34 (1) (f) of the statutes, as created by this act.

5. "Water loss" has the meaning given in section 281.34 (1) (g) of the statutes, as created by this act.

(b) There is created a groundwater advisory committee consisting of the following members:

1. Three persons appointed by the governor.

2. Four persons appointed by the speaker of the assembly.

3. Four persons appointed by the majority leader of the senate.

3g. One member appointed by the minority leader of the assembly.

3r. One member appointed by the minority leader of the senate.

4. The secretary of natural resources or the secretary's designee.

(c) Each appointing authority under paragraph (b) 2. and 3. shall appoint one member representing each of the following interests:

1. Industrial.

2. Agricultural.

3. Environmental.

4. Municipal.

(cm) The governor shall appoint one member of the groundwater advisory committee representing well drillers. The governor, the minority leader of the assembly, and the minority leader of the senate shall consult regarding the other 4 appointees under paragraph (b) 1., 3g., and 3r. to ensure that one represents each of the interests under paragraph (c) 1. to 4.

(d) The speaker of the assembly and the majority leader of the senate shall each designate one appointee as cochairperson of the groundwater advisory committee.

(e) No later than December 31, 2006, the groundwater advisory committee shall report to the standing committees of the legislature with jurisdiction over environmental matters, in the manner provided in section 13.172 (3) of the statutes, recommendations for legislation to address the management of groundwater in the following areas, and administrative rules to implement the legislation:

1. Groundwater management areas, as designated under section 281.34 (9) (a) of the statutes, as created by this act.

2. Other areas of the state in which the withdrawal of groundwater over the long term adversely affects the availability of water for use or adversely affects water quality due to the effects of drawdown of the groundwater and in which there is a need for a coordinated response among the state, local governmental units, regional planning commissions, and public and private users of groundwater to address the effects on groundwater availability or quality.

(f) The groundwater advisory committee shall recommend under paragraph (e) a coordinated strategy for addressing groundwater management issues by affected local governmental units and regional planning commissions with the assistance of the department of natural resources and other state agencies. The committee shall include in its recommendations under paragraph (e) recommendations for a mitigation program for groundwater management areas that is similar to the mitigation program in section 281.34 (8) (d) of the statutes, as created by this act. The committee shall also recommend under this paragraph whether areas described in paragraph (e) 2. should be designated as groundwater management areas and, once designated, how and when to remove the designation of an area as a groundwater management area. The committee shall consult with affected local governmental units in the preparation of the recommendations under paragraph (e).

(g) The groundwater advisory committee shall review the implementation of section 281.34 of the statutes, as created by this act. No later than December 31, 2007, the groundwater advisory committee shall report to the standing committees of the legislature with jurisdiction over environmental matters, in the manner provided in section 13.172 (3) of the statutes, the results of this review and the committee's recommendations for changes in the regulation of high capacity wells that are in groundwater protection areas, that have a water loss of 95 percent or more, or that have a significant environmental impact on a spring, and recommendations regarding the definition of spring in section 281.34 (1) (f) of the statutes, as created by this act. The committee shall include in the report recommendations for statutory authorization for groundwater management strategies that permit adaptation of the regulation of high capacity wells as relevant information becomes available or groundwater conditions change. The committee shall include in the report recommendations regarding the potential for the use of general permits for high capacity wells and recommendations regarding the factors to be considered by the department of natural resources in determining whether a high capacity well causes significant environmental impact for the purposes of section 281.34 of the statutes, as created by this act.

(h) The department of natural resources shall staff and provide funding for the groundwater advisory committee.

(i) The groundwater advisory committee terminates on December 31, 2007.

(3) IDENTIFICATION OF GROUNDWATER PROTECTION AREAS. Notwithstanding section 281.34 (1) (a) 3. of the statutes, as created by this act, until the effective date of the rules promulgated under section 281.34 (8) (a) of the statutes, as created by this act, or the first day of the 19th month beginning after the effective date of this subsection, whichever is later, the department shall identify which streams are class I, class II, or class III trout streams, other than class I, class II, or class III trout streams that are farm drainage ditches with no prior stream history, for the purpose of identifying groundwa-

ter protection areas using sections NR 102.10 and 102.11, Wisconsin Administrative Code, the version of the department's publication Wisconsin Trout Streams published most recently before the effective date of this subsection, and the information available to the department concerning farm drainage ditches.

SECTION 16. Initial applicability.

(1) HIGH CAPACITY WELLS. The treatment of sections 281.17 (1) and 281.34 (2) of the statutes first applies to an application for approval of a high capacity well that is received by the department of natural resources on the day after the effective date of this subsection.

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Appendix B

Chapter NR 820,
Wisconsin Administrative Code

(http://www.legis.state.wi.us/rsb/code/nr/nr820.pdf)

Chapter NR 820

GROUNDWATER QUANTITY PROTECTION

Subchapter I — General Provisions

NR 820.10 Purpose. The purpose of this chapter is to designate areas of the state, consistent with s. 281.34 (9) (a), Stats., in which impacts from groundwater drawdown and pumpage are such that regional planning and management is necessary to avoid, minimize and manage future impacts. This chapter also establishes review criteria applicable to high capacity well applications involving wells situated near springs, trout streams, outstanding resource waters, and exceptional resources waters, and involving groundwater withdrawals with high water loss.

History: CR 06–121: cr. Register August 2007 No. 620, eff. 9–1–2007.

NR 820.11 Applicability. This chapter applies to all counties, cities, towns, villages, utility districts under s. 66.0827, Stats., that provide water, public inland lake protection and rehabilitation districts that have town sanitary district powers under s. 33.22 (3), Stats., joint water authorities created under s. 66.0823, Stats., and municipal water districts under s. 198.22, Stats. This chapter also applies to persons who are owners of high capacity wells and high capacity well systems including persons that propose to construct a high capacity well.

History: CR 06–121: cr. Register August 2007 No. 620, eff. 9–1–2007.

NR 820.12 Definitions. In this chapter:

(1) "Approval" means an approval issued by the department under s. 281.17 (1), 2001 Stats., s. 281.34 (2) or 281.41, Stats., prior to construction of a high capacity well.

(2) "Class 1 trout stream" means a stream, portion of a stream or a farm drainage ditch with a prior stream history that contains a self–sustaining population of trout and is classified as such in Wisconsin Department of Natural Resources publication PUB–FH–806 2002, Wisconsin Trout Streams. Farm drainage ditches that support self–sustaining populations of trout but do not have a prior stream history are not trout streams for purposes of this chapter.

Note: Copies of this document may be obtained from the Department of Natural Resources, Bureau of Fisheries Management and Habitat Protection, 101 South Webster Street, Natural Resources Building, PO Box 7921, Madison, Wisconsin 53707–7921.

(3) "Class 2 trout stream" means a stream, portion of a stream or a farm drainage ditch with a prior stream history that contains a population of trout made up of one or more age groups, above the age one year, in sufficient numbers to indicate substantial survival from one year to the next, but in which stocking is necessary to fully utilize the available trout habitat or to sustain the fishery and is classified as such in Wisconsin Department of Natural Resources publication PUB–FH–806 2002, Wisconsin Trout Streams. Farm drainage ditches that meet these criteria but do not have a prior stream history are not trout streams for purposes of this chapter.

(4) "Class 3 trout stream" means a stream or portion of a stream that has marginal trout habitat with no natural reproduction of trout occurring, requiring annual stocking of trout to provide trout fishing, and generally without carryover of trout from one year to the next and is classified as such in Wisconsin Department of Natural Resources publication PUB–FH–806 2002, Wisconsin Trout Streams. Farm drainage ditches that meet these criteria but do not have a prior stream history are not trout streams for the purpose of this chapter.

(5) "Consumptive use coefficient" has the meaning specified in s. NR 142.02 (4).

Note: s. NR 142.02 (4) defines "consumptive use coefficient" to mean "a constant numerical measure, as determined under s. NR 142.04 (1) to (4) which is used to determine the consumptive use portion of a facility's withdrawal".

(6) "Department" means the department of natural resources.

(7) "80% exceedance flow" means the flow in a stream that, based on statistical probability, will be exceeded 80% of the time on an annual basis.

(8) "Groundwater management area" means a multi–jurisdictional area including towns, cities, villages and counties within which the level of the groundwater potentiometric surface in any of its underlying aquifers has been reduced by 150 feet or more from the level at which the potentiometric surface would be if no groundwater withdrawals had occurred.

(9) "Groundwater protection area" has the meaning specified in s. 281.34 (1) (a), Stats.

Note: s. 281.34 (1) (a), Stats., defines "groundwater protection area" to mean "an area within 1,200 feet of any of the following:

(a) An outstanding resource water identified under s. 281.15 that is not a trout stream.

(b) An exceptional resource water identified under s. 281.15 that is not a trout stream.

(c) A class 1, class 2, or class 3 trout stream, other than a class 1, class 2, or class 3 trout stream that is a farm drainage ditch with no prior stream history as identified under sub. (8) (a).

(10) "High capacity property" has the meaning specified in s. NR 812.07 (52).

Note: s. NR 812.07 (52) defines "high capacity property" to mean "one property on which a high capacity well system exists or is to be constructed."

(11) "High capacity well" has the meaning specified in s. 281.34 (1) (b), Stats.

Note: s. 281.34 (1) (b), Stats., defines "high capacity well" to mean "a well that, together with all other wells on the same property, has a capacity of more than 100,000 gallons per day."

(12) "High capacity well system" has the meaning specified in s. NR 812.07 (53).

Note: s. NR 812.07 (53) defines "high capacity well system" to mean "one or more wells, drillholes, or mine shafts used or to be used to withdraw water for any purpose on one property, if the total pumping or flowing capacity of all wells, drillholes or mine shafts on one property is 70 or more gallons per minute based on the pump curve at the lowest system pressure setting, or based on the flow rate."

(13) "Local governmental unit" has the meaning specified in s. 281.34 (1) (c), Stats.

Note: s. 281.34 (1) (c), Stats., defines "local governmental unit" to mean a "city, village, town, county, town sanitary district, utility district under s. 66.0827 that provides water, public inland lake protection and rehabilitation district that has town sanitary district powers under s. 33.22 (3), joint local water authority created under s. 66.0823 or municipal water district under s. 198.22.

(14) "One property" has the meaning specified in s. NR 812.07 (68).

Note: s. NR 812.07 (68) defines "one property" to mean "all contiguous land controlled by one owner, lessee, or any other person having a possessory interest. Lands under single ownership bisected by highways or railroad right−of−ways are considered contiguous."

(15) "Owner" has the meaning specified in s. 281.34 (1) (d), Stats.

Note: s. 281.34 (1) (d), Stats., defines "owner" to mean "a person who owns property on which a well is located or proposed to be located or the designated representative of that person."

(16) "Potentiometric surface" has the meaning specified in s. 281.34 (1) (e), Stats.

Note: s. 281.34 (1) (e), Stats., defines "potentiometric surface" to mean "a measure of pressure of groundwater in an aquifer based on the level to which groundwater will rise in a well placed in the aquifer."

(17) "Prior stream history" means a determination made by the department that an artificial waterway or a portion of such waterway was originally a navigable stream before it was ditched or channelized.

(18) "Reconstruction" has the meaning specified in s. NR 812.07 (85).

Note: s. NR 812.07 (85) defines "reconstruction" to mean "modifying the original construction of a well. Reconstruction includes, but is not limited to deepening, lining, installing or replacing a screen, underreaming, hydrofracturing and blasting."

(19) "Significant adverse environmental impact" means alteration of groundwater levels, groundwater discharge, surface water levels, surface water discharge, groundwater temperature, surface water temperature, groundwater chemistry, surface water chemistry, or other factors to the extent such alterations cause significant degradation of environmental quality including biological and ecological aspects of the affected water resource.

(20) "Spring" has the meaning specified in s. 281.34 (1) (f), Stats.

Note: s. 281.34 (1) (f), Stats., defines "spring" to mean "an area of concentrated groundwater discharge occurring at the surface of the land that results in a flow of at least one cubic foot per second at least 80% of the time."

(21) "Water loss" has the meaning specified in s. 281.34 (1) (g), Stats.

Note: s. 281.34 (1) (g), Stats., defines "water loss" to mean "a loss of water from the basin from which it is withdrawn as a result of interbasin diversion, as defined in s. 281.35 (1) (g) or consumptive use or both."

(22) "Well" has the meaning specified in s. 281.34 (1) (h), Stats.

Note: s. 281.34 (1) (h), Stats., defines "well" to mean "any drillhole or other excavation or opening deeper than it is wide that extends more than 10 feet below the ground surface and is constructed for the purpose of obtaining groundwater."

History: CR 06−121: cr. Register August 2007 No. 620, eff. 9−1−2007.

NR 820.13 High capacity wells annual pumping reports. (1) Owners of high capacity wells shall record pumpage data on a monthly basis and shall report the information to the department at no less than an annual frequency using methods and forms provided by the department. Reports of annual pumpage for a given calendar year shall be submitted to the department no later than the first day of March in the following calendar year.

Note: Appropriate forms, description of acceptable estimation methodology and reporting procedures will be sent to owners of each high capacity well each year by the department. Copies of these documents may be obtained from the Department of Natural Resources, Bureau of Drinking Water and Groundwater, 101 South Webster Street, Natural Resources Building, PO Box 7921, Madison, Wisconsin 53707−7921.

(2) Individual reports shall be prepared for any high capacity wells with the capacity to withdraw water at a rate of 100,000 gallons per day or more.

(3) If one high capacity property does not contain any single high capacity well with an individual capacity to withdraw water at a rate of 100,000 gallons per day or more, the annual pumpage may be reported as a composite volume for the entire property based on estimated water usage using a method prescribed by the department.

(4) If one high capacity property contains high capacity wells with individual capacity to withdraw water at a rate of at least 100,000 gallons per day and high capacity wells with maximum pumping capacity less than 100,000 gallons per day, a composite pumpage volume based on estimated water usage using a method prescribed by the department may be reported for those wells with individual maximum pumping capacity less than 100,000 gallons per day.

History: CR 06−121: cr. Register August 2007 No. 620, eff. 9−1−2007.

Subchapter II — Groundwater Management Areas

NR 820.20 Groundwater management area designation. The areas specified in subs. (1) and (2) are designated as groundwater management areas. Any local governmental unit contained within these areas shall be considered to be part of the groundwater management area unless it is explicitly excluded in sub. (1) or (2).

(1) Southeast Wisconsin Groundwater Management Area consisting of the following:

(a) All of Kenosha county.

(b) All of Milwaukee county.

(c) All of Ozaukee county.

(d) All of Racine county.

(e) All of Waukesha county.

(f) The portions of Walworth county consisting of the U.S. Public Land Survey townships of East Troy, Spring Prairie, Lyons, Bloomfield, Linn and Geneva, with the exception of the village of Williams Bay and city of Elkhorn, and including the portion of the U.S. Public Land Survey township of Troy that includes part of the Village of East Troy.

(g) All of Washington county with the exception of the U.S. Public Land Survey townships of Wayne and Kewaskum.

(2) Northeast Wisconsin Groundwater Management Area consisting of the following:

(a) All of Brown county.

(b) The portions of Calumet county consisting of the U.S. Public Land Survey townships of Woodville and Harrison and the village of Sherwood.

(c) The portions of Outagamie county consisting of the U.S. Public Land Survey townships of Grand Chute, Van den Broek, Buchanan, Freedom and Kaukauna, including the cities of Appleton and Kaukauna and the villages of Kimberly, Combined Locks and Little Chute.

History: CR 06−121: cr. Register August 2007 No. 620, eff. 9−1−2007.

Subchapter III — Environmental Review of High Capacity Well Applications

NR 820.29 Review periods. (1) HIGH CAPACITY WELLS IN GROUNDWATER PROTECTION AREAS. Unless another time period is specified by law, the department shall complete its review and make a determination on all applications for approval of proposed high capacity wells in groundwater protection areas within 65 business days after receipt of a complete application unless the department notifies the applicant under s. NR 820.30 (4) (a) or (b) that additional information is needed in order for the department to prepare an environmental assessment for the proposed high capacity well.

(2) HIGH CAPACITY WELLS NEAR SPRINGS. Unless another time period is specified by law, the department shall complete its review and make a determination on all applications for approval of proposed high capacity wells near springs within 65 business days after receipt of a complete application unless the department notifies the applicant under s. NR 820.31 (4) (a) or (b) that additional information is needed in order for the department to prepare an environmental assessment for the proposed high capacity well.

History: CR 06−121: cr. Register August 2007 No. 620, eff. 9−1−2007.

NR 820.30 High capacity wells in groundwater protection areas. (1) Except as provided in sub. (2), an application for approval of a high capacity well within a ground-

water protection area shall be supplemented to include all of the following information:

(a) The name of each class 1, 2 or 3 trout stream, outstanding resource water or exceptional resource water that is located within 1,200 feet of the proposed well location.

Note: Outstanding resource waters and exceptional resource waters are identified in ss. NR 102.10 and 102.11. Chapter NR 102 is available for viewing and printing at the internet site for the Wisconsin Legislature, Revisor of Statutes Bureau: http://www.legis.state.wi.us/rsb/code/nr/nr102.pdf. Paper copies of ch. NR 102 may be obtained from the Department of Natural Resources, Bureau of Watershed Management, 101 South Webster Street, Natural Resources Building, PO Box 7921, Madison, Wisconsin 53707−7921.

(b) The distance from each proposed high capacity well to the class 1, 2 or 3 trout stream, outstanding resource water or exceptional resource water.

(c) If the potentially affected water body is a stream, a description of the stream channel at the point nearest to the proposed well location including stream width, depth of water, publicly available information regarding seasonal flow and nature of the substrate.

(d) If the potentially affected water body is a lake or flowage, a description of the lake or flowage including identification and approximate flows of major inlets and outlets, surface area of the lake or flowage, approximate elevation of the current lake or flowage level, analysis of publicly available information pertaining to historic lake level fluctuations, and nature of the lake bed.

(e) A description of all other wells on the high capacity property including location relative to the class 1, 2 or 3 trout stream, or outstanding or exceptional resource water, maximum pumping capacity, estimated actual annual pumpage for each well and frequency of pumping for each well.

(f) A description of the hydrogeologic conditions in the vicinity of the proposed well including flow direction, groundwater elevation, depth to groundwater, and a description of the aquifer characteristics including approximate thickness of each aquifer.

(g) A discussion and analysis of alternative well locations and feasibility of siting the high capacity well outside of the groundwater protection area.

(h) A determination by a registered professional engineer, registered professional geologist or registered professional hydrologist of the 80% exceedance flow for the stream and associated water level at the location closest to the proposed well location.

(i) If the affected water body is a lake, a determination by a registered professional engineer, registered professional geologist or registered professional hydrologist of the 80% exceedance flow and associated water level for the primary surface water outlet and the invert elevation of the primary surface water outlet.

(j) The appropriate consumptive use coefficient.

(2) (a) The department may approve a high capacity well as described in pars. (b) to (e) within a groundwater protection area without preparing an environmental assessment if it determines that construction and operation of the proposed well will not result in significant adverse environmental impact. The information specified under sub. (1) (h) to (j) is not required for a proposed well if any of the conditions in pars. (b) to (e) apply. Based on information submitted by the applicant under sub. (1) and other available information, the department may determine that supplemental information and review is needed in order to issue or deny the necessary approval. The department shall include in any approval issued using the standards under s. 281.34, Stats., conditions to ensure that the high capacity well will not result in significant adverse environmental impacts to trout streams, outstanding resource waters and exceptional resource waters. The conditions may include but are not limited to conditions as to location, depth of lower drillhole, depth interval of well screen, pumping capacity, pumpage schedule, months of operation, rate of flow and conservation measures.

(b) The proposed high capacity well is a well that does not have a pump capacity of greater than 20 gallons per minute and the well is to be used solely for domestic purposes for a single residence.

(c) The proposed high capacity well is intended to be used for purposes such as fire suppression and similar non−commercial, non−industrial and non−agricultural irrigation purposes, and the well will only be used on a sporadic basis averaging less than 30 days each year and will generally operate for no more than 2 consecutive days.

(d) The high capacity well application is for reconstruction of an existing high capacity well and the application does not seek an increase in the approved pumping capacity of the well.

(e) The high capacity well application is for temporary dewatering of a single construction site in unconsolidated deposits and the duration of the project will not extend more than one construction season.

(3) (a) The department may approve a proposed high capacity well without completing an environmental assessment under ch. NR 150 if the proposed well is not a well described in sub. (2) (b) to (e) and the department determines that construction and operation of the proposed well will not result in significant adverse environmental impacts to the stream or lake and at least one of the conditions in subd. 1. to 5. is satisfied. In making this determination, the department shall consider impacts caused by other wells on the high capacity property and take into account actual or current conditions of the Class 1, 2 or 3 trout stream, outstanding resource water or exceptional resource water.

1. The potentially affected water body is a trout stream and the proposed pumping capacity of the high capacity well is less than 10% of the value for the 80% exceedance flow for the stream.

2. The potentially affected water body is an outstanding or exceptional resource water that is a stream and the proposed pumping capacity of the high capacity well is less than 10% of the value for the 80% exceedance flow for the stream.

3. The potentially affected water body is an outstanding or exceptional resource water that is a lake with a surface outlet and the proposed pumping capacity of the high capacity well is less than 10% of the value for the 80% exceedance flow for the primary surface outlet from the lake.

4. The potentially affected water body is an outstanding or exceptional resource water that is a lake with a surface water outlet and a surface area of at least 600 acres.

5. The potentially affected water body is an outstanding or exceptional resource water that is a lake with a surface water outlet, a surface area of less than 600 acres and the volume of water that would be pumped from the well in 30 days of continuous pumping at maximum capacity is less than 5% of the volume of the lake.

(b) The department shall include in any approval issued using the standards under s. 281.34, Stats., conditions to ensure that the high capacity well will not result in significant adverse environmental impacts to trout streams, outstanding resource waters and exceptional resource waters. The conditions may include but are not limited to conditions as to location, depth of lower drillhole, depth interval of well screen, pumping capacity, pumpage schedule, months of operation, rate of flow and conservation measures. The department may also modify the approvals or place additional conditions on the approvals of other previously approved wells on the high capacity property to prevent significant adverse environmental impacts.

(4) All of the following provisions shall apply to proposed high capacity wells that are not included under sub. (3) (a) 1. to 5. and proposed wells that satisfy the conditions under sub. (3) (a) 1. to 5. but for which the department has determined that the proposed well may have a significant adverse environmental impact

on the trout stream, outstanding resource water or exceptional resource water:

(a) The department shall notify the applicant that the proposed high capacity well may have a significant impact on the stream or lake and may require additional information concerning flow characteristics of the affected stream or lake, site−specific geologic and hydrogeologic information and pertinent regional information.

(b) Within 65 business days of receipt of a complete application, the department shall identify additional informational requirements necessary to evaluate the proposed well and may determine that the applicant shall develop and submit an environmental impact report in accordance with s. NR 150.25.

(c) Following receipt of the requested information, the department shall prepare an environmental assessment in accordance with the procedures of s. NR 150.22 and shall develop and publish a news release in accordance with s. NR 150.21.

(d) If the department determines that operation of the proposed high capacity well will not result in significant adverse environmental impact on critical resources within the stream or lake and other uses of the stream or lake, the department shall approve the well and include in any approval issued using the standards under s. 281.34, Stats., conditions to ensure that operation of the proposed well will not cause significant adverse environmental impact to critical aquatic resources or other existing uses of the stream or lake. The conditions may include but are not limited to conditions as to location, depth of casing, depth of lower drillhole, depth interval of well screen, pumping capacity, pumpage schedule, months of operation, rate of flow, ultimate use and conservation measures. In the case of Class 1, 2 and 3 trout streams and outstanding or exceptional resource waters that contain warm water sport fisheries, flow conditions in the stream shall be maintained such that the fish populations and critical habitat are not adversely affected.

(5) As part of an approval issued using the standards under s. 281.34, Stats., the department may require the owner of the high capacity well to implement a monitoring plan to document stream flow or lake level conditions in the vicinity of any well located within a groundwater protection area and based on results of the monitoring program may revise the approval.

(6) The department may not issue an approval using the standards under s. 281.34, Stats., for a high capacity well within a groundwater protection area unless it is able to include and includes conditions that ensure that the well does not cause significant adverse environmental impact.

(7) The department may order the owner of a high capacity well constructed prior to May 7, 2004 that is located in a groundwater protection area to mitigate the effects of the well. Mitigation may include abandonment of the well, replacement of the well, if necessary, and management strategies. If mitigation is ordered, the department shall provide funding for the full cost of the mitigation, except that full funding is not required if the department is authorized under ch. 280, Stats., to require the well to be abandoned because of issues regarding public health.

History: CR 06−121: cr. Register August 2007 No. 620, eff. 9−1−2007.

NR 820.31 High capacity wells near springs. (1) For any application for approval of a high capacity well under s. 281.34, Stats., the department shall determine if there is a spring, as defined in this chapter, located in the vicinity of the proposed well.

(2) If the department determines that a proposed high capacity well is located near a spring the department shall assess the proposed well to determine whether construction and operation of the well will result in substantially reduced flow from the spring and significant adverse environmental impact to the spring. The department shall consider the location of the well relative to the spring, well construction details, information regarding construction and operation of all other wells on the property, available information concerning the geology and hydrogeology of the area, historical flow data for the spring and other pertinent information.

(3) If the department determines that construction and operation of the proposed high capacity well will not result in a substantial reduction in flow from the spring or result in significant adverse environmental impact to the spring, the department may approve the proposed well and shall include in any approval issued using the standards under s. 281.34, Stats., conditions to ensure that the well will not result in significant adverse environmental impact to the spring. The conditions may include but are not limited to conditions as to location, depth of casing, depth of lower drillhole, depth interval of well screen, pumping capacity, pumpage schedule, months of operation, rate of flow, ultimate use and conservation measures.

(4) All of the following provisions shall apply to proposed high capacity wells that are determined to reduce flow in a spring such that significant adverse environmental impact to the spring or related aquatic and terrestrial resources may result:

(a) The department shall notify the applicant that the proposed high capacity well may have a significant adverse environmental impact on a spring and may require additional information concerning flow characteristics of the affected spring, site−specific geologic and hydrogeologic information, a discussion and analysis of alternative well locations, and pertinent regional information.

(b) Within 65 business days of receipt of a complete application, the department shall identify additional informational requirements necessary to evaluate the proposed well and may determine that the applicant shall develop and submit an environmental impact report in accordance with s. NR 150.25.

(c) Following receipt of the requested information, the department shall prepare an environmental assessment in accordance with the procedures of s. NR 150.22 and shall develop and publish a news release in accordance with s. NR 150.21.

(d) If the department determines that operation of the proposed high capacity well will not result in significant adverse environmental impact to the spring and related resources, the department shall approve the well and include in any approval issued under s. 281.34, Stats., conditions to ensure that operation of the proposed well will not cause significant adverse environmental impacts to the spring or critical resources related to the spring. The conditions may include but are not limited to conditions as to location, depth of casing, depth of lower drillhole, depth interval of well screen, pumping capacity, pumpage schedule, months of operation, rate of flow, ultimate use and conservation measures. The department may approve a proposed high capacity well that is predicted to result in a reduction of flow in a spring only if the predicted reduction would not cause permanent and irreversible impacts to the spring and related resources. The department may not approve a proposed high capacity well that is predicted to result in a reduction in flow from a spring such that the spring does not flow at one cubic foot per second or greater at least 80% of the time or that will reduce the average annual flow from a spring by greater than 20%.

(5) As part of an approval issued using the standards under s. 281.34, Stats., the department may require the owner of the high capacity well to implement a monitoring plan to document conditions of the spring and related resources and based on results of the monitoring program may revise the approval.

History: CR 06−121: cr. Register August 2007 No. 620, eff. 9−1−2007.

NR 820.32 Projects with high water loss. (1) For any application for approval of a high capacity well under s. 281.34, Stats., the applicant shall identify and the department shall verify whether the proposed use of the well will result in an annual water loss of greater than 95%. The department may require submittal

of a detailed water balance as part of the application in order to determine the approximate water loss.

(2) If the department determines that a proposed high capacity well will result in an annual water loss of greater than 95%, the department shall notify the applicant that the proposed well may result in a water loss of greater than 95%. Within 65 business days of receipt of a complete application, the department shall identify additional informational requirements necessary to evaluate the proposed well and may determine that the applicant shall develop and submit an environmental impact report in accordance with s. NR 150.25.

(3) Following receipt of all requested information, the department shall prepare an environmental assessment in accordance with the procedures of s. NR 150.22, and shall develop and publish a news release in accordance with s. NR 150.21.

(4) If the department determines that construction and operation of the proposed high capacity well will not result in significant environmental impact to surface and groundwater resources, the department shall approve the well and include in any approval issued using the standards under s. 281.34, Stats., conditions to ensure that operation of the proposed well will not cause significant adverse environmental impact to surface water or groundwater resources. The conditions may include but are not limited to conditions as to location, depth of casing, depth of lower drillhole, depth interval of well screen, pumping capacity, pumpage schedule, months of operation, rate of flow, ultimate use and conservation measures.

(5) As part of an approval issued using the standards under s. 281.34, Stats., the department may require the owner of the high capacity well to develop and implement a water conservation and management plan that minimizes, to the extent technically and economically feasible, the degree of water loss related to operation of the high capacity well system.

(6) As part of an approval issued using the standards under s. 281.34, Stats., the department may require the owner of the high capacity well system to implement a monitoring plan to evaluate environmental impacts caused by operation of the high capacity well system and based on results of the monitoring program may revise the approval.

History: CR 06−121: cr. Register August 2007 No. 620, eff. 9−1−2007.

NR 820.33 Public utility wells. Sections NR 820.30 to 820.32 do not apply to proposed high capacity wells that are water supplies for public water systems operated by a public utility, as defined by s. 196.01, Stats., engaged in supplying water to or for the public, if the department determines that there is no other reasonable alternative location for the well and includes in the approval conditions that ensure that the environmental impact of the well is balanced by the public benefit of the well related to public health and safety. Conditions of the approval for the well may include, but are not limited to, conditions as to location, depth, pumping capacity, rate of flow, and ultimate use.

History: CR 06−121: cr. Register August 2007 No. 620, eff. 9−1−2007.

Appendix C

March 11, 2005, Letter From Secretary Hassett

(http://dnr.wi.gov/org/water/dwg/gac/GACcharge.pdf)

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary

101 S. Webster St.
Box 7921
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
FAX 608-267-3579
TTY 608-267-6897

March 11, 2005

To Members of the Groundwater Advisory Committee:

As the agency that will staff the Groundwater Advisory Committee, I am providing an initial scoping statement. The sponsors of this historic legislation, along with the Governor have stated that this legislation is a very important and necessary "first step". That first step was taken when the Legislature passed this legislation and the Governor signed it into law on Earth Day, 2004.

There are many important steps to take to fully protect groundwater quantity. This committee is a critical piece. It is your job to make sure we keep taking steps forward and in the correct direction. It is your job to assure that we can adapt our management, as new and better information becomes available. I have worked with the Governor's office as well as former Representative Johnsrud and Senator Kedzie to develop some more of the details of the "charge" to this committee. The following is how we see the committee operating once appropriations are approved.

We ask you to address two different, yet broad scopes of responsibility. We have identified them below as "charges". In the first charge, you will provide recommendations on how we should manage areas of the state that have existing groundwater quantity problems. These are called Groundwater Management Areas (GMAs). There are specific tasks for you to accomplish as you address GMAs; however, the issues potentially included in those tasks are quite broad. For the second charge you will provide a "report card" of sorts. Your report will tell us how we are doing in Groundwater Protection Areas (GPAs), along with finalizing several other issues.

First Charge

By December 31, 2006, report to the legislature's environmental standing committees on:

A. recommendations for legislation and for administrative rules to implement the legislation, covering the following areas:
   1. groundwater management areas (GMAs) as created by the act,
   2. other areas of the state in which the withdrawal of groundwater over the long term adversely affects the availability of water for use, adversely affects water quality; or has a significant adverse environmental impact
B. recommendations for:
   1. a coordinated strategy for addressing groundwater management issues by affected local governmental units and regional planning commissions,
   2. a mitigation program for GMAs, including Best Management Practices, water conservation measures and other holistic processes
   3. whether other areas of the state should be designated as GMAs,
   4. how and when to remove the GMA designation from an area.

Second Charge

By December 31, 2007, report to the legislature's environmental standing committees on recommendations for how the scope of the law has worked in several areas including:

A. for high capacity wells that are:
   1. in groundwater protection areas (GPAs)
   2. that have a water loss of 95 percent or more, or,
   3. have a significant environmental impact on a spring;
B. regarding the definition of spring, specifically, is the 1 CFS threshold the right threshold;
C. for management strategies that permit adaptation of the regulation of high capacity wells as relevant information becomes available or groundwater conditions change;
D. the potential use of general permits for high capacity wells;
E. factors the department should consider in rules used to determine whether a high capacity well causes a significant environmental impact.

A report regarding the committee's first charge must be issued no later than January 1, 2007. If the committee does not meet that deadline, the law directs the department to promulgate rules using its authority to address the management of groundwater in groundwater management areas.

As I mentioned before, the tasks are specific, but the possible solutions will require multiple considerations. As examples, you will be expected to consider:

- water conservation,
- gray water reuse;
- dual systems,
- cumulative impacts of low capacity wells at high densities,
- adequacy of fees in GMAs and GPAs,
- and mitigation sunsets.

This is what we are charging you with but additional challenges are certain to emerge. We urge you to address each new issue and when your task has been completed, the next step will have been taken to protect Wisconsin's vital groundwater.

As this legislation was developed, one of the many strengths of the process was that scientists advised the subcommittee. Your committee will also have a science advisory panel to which you may refer technical issues. Representatives from organizations such as the Wisconsin Geologic and Natural History Survey, the United States Geological Survey, the University System and the Watershed Center in Stevens Point will be asked to serve. We thank you for your willingness to serve and look forward to the work that is ahead of all of us.

The legislation specifically states that the committee will terminate on December 31, 2007.

Sincerely,

Scott Hassett
Secretary

cc: Senator Neal Kedzie — Representative Scott Gunderson
Pat Henderson — Todd Ambs

Notes:

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